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CORALLINA.

CORALLINA;

OR,

A CLASSICAL ARRANGEMENT
OF
FLEXIBLE CORALLINE POLYPIDOMS,

SELECTED FROM THE FRENCH
OF
J. V. F. LAMOUROUX, D. E. S.

LONDON:
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1824.

The term ***Polypier*** being found difficult to translate into English, the name Polypidom, signifying dome or dwelling of the polypi, has been adopted in its place.

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THE TRANSLATOR'S PREFACE.

THE following selection was originally designed for the accommodation of friends, whose leisure was too much engrossed by kindred and social claims, to study a history which, though interesting in the extreme, was written in a foreign language, and replete with scientific terms.

The Translator had fewer ties, and anxious that her friends should share the increasing pleasure she felt in perusing M. Lamouroux's "Histoire des Polypiers Coralligènes Flexibles," she consulted among scientific dictionaries, and her more learned acquaintances, for the explanation of obscure terms. She was induced at length to hope her exertions might extend to the gratification of others of her sex, and give a direction to the delight and admiration so generally experienced on first visiting the coast, where all is exhilarating and new, and where we feel inclined to view every scattered object fresh imported from the deep with curiosity and interest.

No books are wanting in the beautiful department of Marine Botany; but any knowledge of Polypidoms, (hitherto known under the general denomination of Corals and Corallines, prior to M. Lamouroux's Histoire, &c. if we except Ellis's Corallines, and a subsequent work on Zoophytes, edited by Solander,) had only been dispersed in the works of learned men.

If, therefore, in this selection, the Translator can enable her countrywomen to decipher one more page of lovely Nature, and, in retracing the wonders of creation, strengthen their consciousness of SUPERINTENDING GOODNESS, and revive the heartfelt conviction that, "in wisdom hast thou made them all," her best wishes will be accomplished.

In the following pages no species has been omitted, described by M. Lamouroux: but as the chief object was to benefit those who, like the Translator, were interested in Nature's history, and unskilled in learned languages, she has not inserted the Latin descriptions, nor the transcriptions from other authors. Depending solely on M. Lamouroux for her guide, she has contented herself with the harvest he reaped from the labours of his predecessors, and the result of his own studious observations. Those who lament the discarded treasures, must seek them in his original.

INTRODUCTION.

NOTWITHSTANDING the information of celebrated voyagers and philosophers, much yet remains unknown of those Polypidoms which people the vast empire of the deep ; a very small number of their polypi have been observed, and entire orders still exist, whose animals have not to this moment been discovered: no light has been thrown on their organization, their growth, or their continuance ; all yet remains in obscurity respecting the physiology of this singular class of organization; but that they are wholly animal, remains no longer a doubt, and the term Zoophyte, though still used, becomes, from its signification of animal plant, not strictly applicable.

The Polypidoms present no character so decided, as serving for habitation, and forming the most solid part of many living animals, united, and incapable of voluntary separation from each other. These animals, or polypi, have but one character in common, that of being continually attached to an animated mass, sharing in, and contributing to, its existence; and, notwithstanding this involuntary attachment to the colony, each individual possessing a life peculiar to itself, and distinct from the rest of the colony, all the polypi of a Polypidom participate in its existence; and the food which one of these little creatures takes in, extends its influence to the most distant part of the colony it belongs to.

CLASSES, ORDERS, &c.

The arrangement into Classes, Orders, Genera, and Species, so advantageously employed in Botany, has been adopted in the present work; the Polypidoms are separated into four Classes, with the first of which we commence a sketch of our History.

The first Class is that of the celluliferous Polypidoms, whose polypi are found in shelly or non-irritable cells; it is divided into three Orders, beginning with that whose cells are apparently isolated;

it comprehends the Flustreas, Cellarias, &c. The second Order includes all those with coalescent or united cells, formerly all styled Sertularia. The Tubularia forms the third Order, their cells being tubular and horny, simple or branching, with one or many openings.

The second Class, whose Polypidoms are styled Calciferous, are of a calciferous substance, mixed with that of animal, and continuing apparent in every stage, contains also three Orders; the first of which has, like the Tubularias, the polypi at the extremities of the stems and branches, but, being less horny and more calcareous, forms an intermediate link between the last Order of the preceding Class and the second Order of the present Class, whose Polypidoms are very cretaceous or chalky, but whose polypi are not apparent; they are articulated. The third Order of this Class are not articulated.

The Polypidoms of the third Class are termed Corticiferous: they are composed of two substances, the one exterior, and enveloping, named *rind,* or incrustation; the other called *axe,* placed in the centre of the first, and supporting it: it is also divided into three Orders. The first Order comprehends the Spongia, whose polypi are dubious, but decidedly invisible. The second includes the genera of the

Gorgonia, whose axe is inarticulated. The third Order contains the Isideæ, whose polypi are more apparent, and the axe articulated.

The fourth Class has no Order; it is denominated Carnoid Polypidoms, composed of a fleshy mass, wholly animated, covered with polypi, and possessing no central axe.

SITUATION.

The greater number of Polypidoms are found to originate in the heart of the ocean, and in its numerous divisions, with the exception of the Naissas and the Ephydatias, which always inhabit fresh water, whether stagnant or current.

Some of the Polypidoms appear to prefer the immediate influence of the atmospheric changes; they are seen on the rocks and on the plants which the tide leaves uncovered, and sometimes in such profusion, that all appear concealed under an animated membrano-calcareous covering. These species, however, at least on our shores, are neither numerous, nor attain any considerable size.

They almost all suffer from the action of the air. At the period of the great equinoctial tides, the sea retires from those rocks it covered for many preceding months: when the water first leaves them, the polypi are full of life, but suffer and languish as they lose their moisture; nor fail to perish should the sea remain too long without re-covering them: those that can retire into the recesses of their cells, are more enabled to hold out, by means of the moisture they preserve; but the uncovered polypi, and those whose whole mass is animated, like the Alcyones, experience a quicker alteration, proportioned to the higher temperature and the dryness of the air. Taken in this state of sufferance, and replaced in sea water, these little animals slowly resume their activity: there are some which do not expand their tentacula till the second or third day, whilst those which immediately after their exposure to the air have been carefully returned to their natural element in a tranquil place, where the water was not agitated, have as soon expanded from their cells, or the mass to which they were attached. It may be necessary to remark, that naturalists have sometimes erred, in describing the polypus contracted, for the polypus expanded.

Some species of Polypidoms are found always situated on the southern slopes of the rocks, but never on those of the east, west, or north: others, on the contrary, develope only on the last aspects, and never on the first: in general their branches appear directed towards the main sea.

The larger Polypidoms are rarely found in places exposed to violent currents, or the full shock of the waves. It is in the hollow of rocks, in the submarine grottos, in the shelter of large and solid masses, and above all, in those gulfs where the waters are not agitated, that these singular beings fix themselves. Many of them appear formed to share the powerful action of the surges; their pliant branches bending to the movements of the waters, and balancing the animals that form them in the agitated medium. Others again, constructing immovable and rocky dwellings, give them the form of tunnels, placing themselves in the interior: while some, by their re-union or aggregation, form an extended mass, narrow in proportion to its length, prolonging it uninterruptedly many terrestrial degrees, and forming an immovable dike, which usually crosses the great currents of the ocean, whilst its solidity and greatness are continually augmenting. Sometimes these madrepore rocks curve in the form of a circle; the polypi that inhabit it, established in its interior, elevate by slow degrees their rocky dwellings to the surface of the waters: thus, ever sheltered in their labours, they load by slow degrees the bottom of the deep; but in the higher part of this impenetrable wall openings are always left that communicate with the external waters, that the polypi within may be continually supplied with aliment, and the principal materials for the construction of their habitations.

The navigator confidently sailing in a sea that his predecessors have indicated as free from rocks, dashes his prow on an unexspected shelf, whose sides are so perpendicular, that at his stern no sounding can be found; and when combating with the fury of the tempest he meets one of these openings which chance or the instinct of the polypi have left unclosed, he enters a harbour of slightly undulating waters, sheltered from the contending storms, which without the barrier seem bent on its annihilation, but cannot shake it.

The Polypidoms do not always rise to the surface of the waters; some extend themselves horizontally on the base of the sea, or pursue its curvatures, and spread Ocean's floor with an enamelled carpet of varied and brilliant colours; at other times this carpet has only one shade, almost equalling the Tyrian purple of antiquity. Many of these beings resemble a bush that winter has despoiled of its leaves, but which spring has renovated with fresh flowers; and attract by the beauty of the petaled animals with which their branches are covered from the base to the extremities.

The Polypidoms are found near the surface of the water as well as in the greatest depths of the ocean: some exist in parts where the light of the sun cannot reach, and multiply to infinity, notwithstanding the enormous pressure and extreme cold which they must experience, at a depth of two or three thousand fathoms. There are strong grounds to presume that their growth is slow in proportion as they are immersed in the water, and that at a thousand *metres* from the surface of the sea, it would be one hundred years before coral would attain the same growth as when only a few *metres* of the fluid covered it.

Polypidoms as well as plants vary with the climate they inhabit; in the colder latitudes the Cellarias and Sertularias only are to be found, with a few close-woven sponges, and a small number of Alcyones. In the neighbourhood of the volcanic isles of the polar regions, or on those shores exposed to that marine flow, which after being heated with the tropical sun, has bathed the eastern coast of America, and then directed its course to the western shores of Europe, you meet with Corallinas, with Gorgonias and Isidias: the two first multiply a little from 60 to 50 degrees of northern latitude; their numbers then increase to the 44th or 45th degree: Gorgonias with rampant stems, Spongias, with loose tissue, brittle or elastic, and

Millepores with foliated and fragile expansions: a little further the coral reddens the depths of the ocean with its brilliant branches, soon followed by the Polypean madrepores. It is not however before the 34th degree of northern latitude that these animals commence the developement of that grandeur and immensity that presents itself at every step to the extent of a parallel southern latitude; here they disappear, after having exhibited the same series of phenomena observed in the northern hemisphere.

It is then within the tropics, or in a zone of more than sixty degrees expansion, that these beings, these animalcula, scarcely visible to the naked eye, and whose operations uninterruptedly proceed, eternally exercise their empire in a medium whose temperature never changes. From the depths of the ocean they elevate those immense reefs, that may in their consequences entertain a communication between the inhabitants of the temperate zones. The naturalist when he visits these madreporous islands, once covered with the ocean, is astonished at their enormity and perfect preservation—so perfect, that the sea seems recently to have abandoned them; and frequently the same species of Polypidom that crowns the greatest heights, and forms the whole island, extends from its shores to an endless distance; so that when the tide retires, perhaps an intermediate league presents the same Polypidom to observation, that composes the heads of their mountains. The air, light, and rains, have contributed to destroy the animals of these madrepores; their skeletons alone remain to attest the ancient sojourn of the ocean in these elevated sites, and the slow but incessant diminishing of the waters on the planet we inhabit. Voyagers have found fossil madrepores on the Alps, the Pyrenees, &c. M. Ramond, in a letter to M. de St. Amans, says, "he discovered marine relics on the summit of Mount Perdu," the highest of the Pyrenees.

BASE OR POINT OF FIXING.

Some plants are found in all latitudes, in all countries, and in all soils, whether on the roof of the cottage, or on the marble of the palace: the number of these plants is however inconsiderable. The majority of vegetables that adorn the surface of the globe, require a particular soil and climate: the same is not the case with Polypidoms; few among them prefer one substance to another in fixing: the greater number of these beings, requiring only one point of rest, attach indifferently to any hard or solid body the sea contains;

They are seen on primitive, secondary, and other rocks, sometimes on stems of coral, or on blocks of lava, on fragments of vases, and even on human skulls, which are exhibited in museums. Sometimes these Polypidoms wholly envelope the wood that floats upon the water; at other times they surround and bury the fragments of wrecks, and the old vessels that are abandoned in the ports; in fine, there are some whose base, dividing into numerous fibres like those of a root, penetrates deep into sandy or muddy shores to find a point of fastening which the surface cannot afford them. In general their base is solid or extended in the corticiferous Polypidoms; fibrous in the calciferous; and non-existing, or almost so, in the carnoid Polypidoms and the celluliferous. Thus, as this part only serves the Polypidom to fix itself, we may consider it as a means employed by Nature to prevent these beings, deprived of locomotion, from becoming the sport of the waves; in this respect only they resemble vegetables.

DURATION.

All organized beings have three epochs of existence —their growth, their perfection, and their decline— both among the animal and the vegetable world.

Some commence and finish their existence in the short space of a day, perhaps an hour, while others live through centuries. The same occurs among the Polypidoms; some have only an ephemeral life, while the existence of others seems eternal. I here speak of the Polypidoms, not of the polypi; the latter, separately considered, do not appear to have a long life, but on the contrary many circumstances induce us to presume it is very short.

In the Flustreas, Cellarias and Sertularias are found annual species, and others whose duration is subordinate to the marine plants that support them. In almost all Polypidoms, the lower parts are wholly devoid of animalcula, and in the greater they are only seen at the extremities: some there are, that are entirely covered with polypi through the summer and autumn, but they perish with the cold of winter. No sooner however has the sun resumed his revivifying influence than new animals are developed, and fresh branches are produced upon the old ones; the lower part appears inert, and deprived of all kind of life; the Flustreas, Sertularias, and Gorgonias afford us many examples. Arrived at this last stage of existence, the Polypidom languishes, it has no longer the power to resist the destructive influence of time, or the attack of those enemies which the energies of life had till then repulsed: some of them feed on its fleshy envelope; others penetrate to the interior of the axe, and live on its substance however solid it may be, till at last perishing, its fragments are cast upon the shore in a state scarcely recognizable, and at the mercy of the elements finally reduced to calcareous sand.

FORMS.

Their forms are too various to admit a general description, as may be seen in the following outline.

The Celluliferous Polypidoms appear in aggregations of isolated cells, placed on the surface of marine bodies; or else cells so united as to form, by their adherence to each other, a thin crust on the surface of the Thalassiophytes or testaceous Molluscas; and frequently appear in leafy and diversified expansions: sometimes the cells are placed on stems, like leaves on their branches; at other times these cells appear in the form of very long branching or simple tubes, separated from each other in their upper part, and united in their lower to form stems, as well as a footing or root by which they adhere to a solid base.

In the Calciferous Polypidoms there are also great disparities; some of them ramify like shrubs, whilst others divide in numberless dichotoma, or imitate a painter's brush, or take the form of an umbrella; some resemble an open fan; in short, some are simple, some are branched, some articulated, some compressed, some flat, and some cylindrical.

The Corticiferous Polypidoms display an equal variety: there are Spongiæ that spread in thin patches on the rocks and marine plants; others form themselves in globular masses, or are hollowed in the form of tunnels; many rise in tubes like the pipes of an organ, and some divide in the form of thick leaves. What diversity of forms between the Gorgonias with a simple unbranched stem, and others whose anastomosised branches resemble fishing-nets, from their net-work and extent! The Flabellated Andyomena exhibits meshes so regularly and elegantly designed, that they strike us by their resemblance to lace.

The Isidias have an alternately stony and cartilaginous stem, bearing some resemblance to the vertebræ of animals more perfect in their organization; others in appearance may be compared to shrubs despoiled of their leaves, but covered with flowers whose whiteness is rendered more conspicuous by the deep and brilliant red of the branches.

To conclude: in the Carnoid Polypidoms differences almost as numerous exist, but much less known than those described in the preceding Orders.

After this sketch, a general definition of their form will scarcely be expected; for if this be impracticable as respects one division, what must it be in regard to all these animal productions?

COLOURS.

If, notwithstanding the energetic influence of air and light upon these organized beings, we may judge from the hues that still remain to them in the collections, their colours must be varied and brilliant in the extreme on their natural sites in the depths of the sea. The atmospheric fluids have a rapid influence on the colour of the Polypidoms: it is by no means rare to see a Sertularia of a brilliant yellow when first discovered in the sea, turn to a tarnished brown three hours after it has left it. The change sometimes is still more rapid; I have seen Spongiæ, of a lovely lilac when covered with the water, become nearly white when exposed a few minutes to the contact of air and light. There are however Polypidoms preserved many years in the collections, whose colours appear more permanent; their stems are of a bright and deep hue, or their rind is of a brilliant colour: we can readily suppose this envelope to have been infinitely brighter while the polypi were in life ; it is however not impossible that, like many of the marine Floridas, some of these animal productions may assume more varied and brilliant hues from the combined effect of light, humidity, and their first step towards decomposition.

These general considerations on Polypidoms are not applicable to the Polypi; these latter are sometimes of the clearest transparency, at others this transparency is clouded and whitish; frequently they partake of the colour of the animated mass to which they belong, only differing in shades according to the different parts of organization. In many of the Gorgonias and in some Alcyonias the colour of the Polypi is entirely different from that of the Polypidom, and forms an agreeable contrast. In general their brilliancy and transparency become tarnished and opaque, as soon as deprived of life, or exposed to the influence of the air.

SIZE.

With respect to size, we find Polypidoms so small that it requires the aid of glasses to distinguish them, whilst others are as elevated as the mountains: their base fixed on the foundation of the sea, to a depth that cannot be measured, whilst their extremities are lost in the regions of the clouds: such are the madreporous islands so numerous in the South-eastern Ocean, which Polypi are every day augmenting by their inconceivable labours. Some authors have imagined that these isles were only the summits of submarine mountains, that had been covered by Polypidoms; but these submarine mountains, the almost perpetual source of subterranean fires, are found in all latitudes, and greatly vary in their extent and in their forms: the madreporic islands, on the contrary, exist only within the tropics, and present forms constantly analogous to each other, and are never overturned by earthquakes or volcanic eruptions. They are described by most modern voyagers who have traversed those seas.

If we compare this polypean mass, that rises from the immeasurable depths of the ocean to its surface, and that shoots into air under the form of mountains, to that Melobesia, to that Cellepora, which has only the appearance of a white spot, a small deposite of calcareous particles, how striking is the difference! what an infinity of intermediates must exist between the two extremes! Generally speaking, the Cellular Polypidoms, as well as the Calciferous and Carnoid, seldom exceed a metre in height; usually they are much smaller. The Corticiferous are sometimes many metres in height. It is then in the Madreporic Polypidoms, those that are wholly stony, that we must seek for giants in this department of the animal kingdom; whilst their Polypi are so small as frequently to elude the naked eye, and can only be perceived by the help of glasses, and sometimes require very powerful microscopes; in some groups they even escape the power of our instruments, and leave us only analogy and reason to demonstrate their existence in the animal kingdom. It is however not improbable that the Equinoctial seas may inclose Polypi of sufficient magnitude to be observed without the help of instruments; but none of them exist on our coasts, or in the north of Europe.

UTILITY, GENERAL AND PARTICULAR.

The unreflecting may ask, what is the utility of these creatures; too small to afford material nourishment to others, yet capable of rendering venomous those which partake of the little they can supply? Devoured by fishes, the Polypi have rendered those fishes so unwholesome, that soldiers who have fed on them have experienced maladies so serious and so general, that the expedition for which they were intended has been necessarily given up.

Other species of fish, and in particular the mollusca when fished from these madreporous rocks, have been found to possess an insufferable stench; this may be occasioned by the Polypi being in a state of decomposition, as their fetidness is then sufficiently powerful to cause vertigos, and even suspended animation; as I myself experienced whilst preparing the Antipathes Myriophylla, which a friend had sent me from Nice.

Sometimes they wholly envelope in a calcareous coating the vegetables of the sea, and, in obstructing the pores necessary for their aliment, cause them to perish in an animated prison. Innumerable instances of their power of annoyance might be adduced, such as choking up harbours, causing shipwrecks, &c. &c.

But He who formed the Universe, created nothing in vain! His works all harmonize to blessings, unbounded by the mightiest or most minute of His creation. Each day displays to the reflecting, new proofs of His wisdom in new developements of His plans, and gives fresh force to the conviction that our ignorance alone must obscure our view, when we cannot comprehend His aim of eternal good.

On land, the vegetable tribes absorb the carbonic acid our inhalements have created, and return us the life-giving oxygen. In the bosom of the deep, the Polypi absorb the calcareous salts brought from the various countries whose coasts it has visited; which salts by an eternal increase might otherwise prove as destructive to its inhabitants, as the carbonic acid proves to those on land; but the Polypi collect, decompose, and render them insoluble to the surrounding element which their labours have thus purified; they unite them in a mass of such extent, that in the course of time the domain of man becomes enlarged, and vegetation blooms and blesses with its fruits on the structures that have ceased to serve them.

One circumstance worthy to be observed, must not be omitted. To the assistance of Lime we owe the elegance and solidity of our buildings, particularly the latter. The calcareous stone, or Carbonate of Lime, that Proteus of the mineral world, is wholly wanting in the Equatorial regions: may we not be allowed to consider these Madreporous Polypidoms as destined to supply its absence? At Djeddah in Arabia, and on many other parts of the Red Sea coast, the houses are constructed with blocks of beautiful Madrepore. In the Indian Isles, as well as in those of the Eastern Ocean, and in many other parts, the madrepores are used for the manufacture of lime: at Martinique they drag them for that purpose from the bottom of the sea.

What could we substitute for the Sponges in medicine, or for domestic uses? where should we find a substance equal to this polypean production in the property of imbibing water, without any diminution of elasticity or alteration of its nature? The sponges we have in use, are found in the equinoctial seas of both worlds, and in the warmest parts of the temperate zones: they are an object of considerable commerce; many of the Mediterranean isles have no other product to export.

In France, and throughout Europe, the Corallina Officinalis is used as a powerful anthelminthic; it is known under the name of Coralline of Corsica, and brought from the different ports of the Mediterranean; it is very abundant on the western coasts of France, and also on the shores of England. Sir H. Davy has remarked, that it has a fattening tendency, as well as others of its family.

The inhabitants of Iceland, celebrated for its frosts and its volcanos, make use of a Flustra in the form of snuff, to excite sneezing: either on account of its agreeable smell, resembling violets, or as a preservative against the scurvy, so dangerous in those regions.

To conclude. In all ages and in all countries, men have acknowledged the beauty of the Coral. Warriors have always employed it in the decoration of their arms, and women in their dress. The physicians of the middle ages looked upon it as a universal remedy; and the priests of ancient religions, as an object acceptable to the gods.

After this rapid sketch of Polypidomean history, it may be easy to comprehend how bounded is our information in this department of nature: the most that we do know, is nothing in comparison to what we do not know. It is therefore to draw the attention of intelligent men to these new objects of Natural History that I have been induced to publish this work, in which I have endeavoured to unite the remarks of my predecessors, and to augment the domain of science by some new observations of my own.

J. V. F. Lamouroux.

MEASURES.

1 Metre	40 inches.
1 Decimetre . . .	4 inches.
5 Centimetres . . .	2 inches.
10 Millemetres . . .	1 centimetre.

POLYPIDOMS.

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4 CLASSES.

CLASSES.

1st Class. Celluliferous Polypidoms in non-irritable cells.—3 Orders.

2nd Class. Calciferous Polypidoms. Calcareous substance, united with animal substance, or incasing it: apparent in all circumstances.—3 Orders.

3rd Class. Corticiferous Polypidoms, composed of two substances; one exterior and enveloping, called Rind, or Incrustation; the other named Axe, placed within, and supporting the first.—3 Orders.

4th Class. Carnoid Polypidoms. A fleshy mass, wholly animated, covered with polypi, but having no central axe.—No Order.

ORDERS

BELONGING TO THE FIRST CLASS.

1st Order. Cells isolated, or else uniting in each other's formation, as do the cells of a honey-comb.

2nd Order. Cells of distinct formation, but uniting together, and coalescing with the stem.

3rd Order. Cells tubular in form, and horny in substance.

ORDERS

BELONGING TO THE SECOND CLASS.

1st Order. Polypi at the extremity of the Polypidom or its branches.

2nd Order. Articulated Polypidoms; Polypi not apparent.

3rd Order. Inarticulated Polypidoms.

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ORDERS

BELONGING TO THE THIRD CLASS.

1st Order. Polypi none, or not perceptible.

2nd Order. Polypi apparent; axe inarticulated.

3rd Order. Polypi apparent; axe articulated.

No Orders belonging to the 4th Class.

GENERA

BELONGING TO THE FIRST ORDER OF THE FIRST CLASS.

Cellepora. Submembranous, in concrete expansions. Cells projecting.

Flustra. Concrete expansions, foliated; submembranous. Cells united in formation, and placed in series, on one or many surfaces.

Pherusa. Flat and frondescent. Cells oblong, projecting, and only on one surface.

Electra. Branching. Cells campanulated, ciliated, and verticillated.

GENERA.

FIRST CLASS.—FIRST ORDER.

Elzarina. Cylindrical and inarticulated. Cells dispersed, and almost projecting.

Cellaria. Cylindrical and articulated. Cartilaginous and stony, cells dispersed.

Caberea. Slightly compressed and articulated. Cellular in front, and furrowed in the back.

Canda. Dichotomous, and fan-shaped. Branches united by diverging side fibres.

GENERA.

FIRST CLASS.—FIRST ORDER.

Acamarchis. Dichotomous. Cells in united formation, alternate and vesicular.

Crisia. Cells generally alternate, slightly projecting, and opening on the same side.

Menipea. Articulated. Cells grouped in wreaths, opening only on one side.

Eucratea. Articulated. A solitary and a curved cell at each articulation.

GENERA.

FIRST CLASS.—FIRST ORDER.

Ætea. Stem rampant, and branching. Cells solitary, and club-formed. Opening at the side.

GENERA

BELONGING TO THE SECOND ORDER OF THE FIRST CLASS.

Pasithea. Articulated. Cells in threes, or in fours, at each articulation.

Amathia. Cells long and cylindrical; either all touching, or separating in many groups of various sizes.

Nemertesia. Garnished with minute branches, or rather polypiferous hairs, bent towards the stem, and verticillated.

Aglaophenia. Little branches, pinnated. Cells on one side; axillary or isolated.

GENERA.

FIRST CLASS.—SECOND ORDER.

Dynamena. Not much branching. Cells opposite.

Sertularia. Stem or branches flexible. Cells alternate.

Idia. Branches pinnated and alternate. Cells alternate, nearly awl-shaped, and curved.

Clytia. Stem filiform, twining or climbing. Cells campanulated and pediculated; pedicles long and curved.

GENERA.

FIRST CLASS.—SECOND ORDER.

Laomedea. Plant-like. Cells dispersed; pedunculated, or almost sessile.

Thoa. Stem formed of numerous interwoven tubes. Ovaria in clusters.

Salacia. Cells long, cylindrical, and in united formation to the number four; side and verticillated openings.

Cymodocea. A pulpy stem, marked with rings in the lower part, and smooth in the upper. Cells filiform, alternate or opposite.

GENERA.

BELONGING TO THE THIRD ORDER OF THE FIRST CLASS.

Tibiana. Branches in zig-zags. Polypous openings, placed alternate, and on the sides, at the summits of the angles.

Naisa. In fresh water. Polypi with each a single row of tentacula, generally ciliated.

Tubularia. Tubular, simple or branched. A solitary polypus at the extremity of each branch.

CLASS I.—ORDER I.

GENERA AND SPECIES.

CELLEPORA.

POLYPIDOMS partly membranous; in stony concrete expansions, or subfoliated: very fragile, and furnished on their external surface with urceolated, or else turban-shaped projecting cells.

The Celleporas are not remarkable either in form or colour; they often escape observation, appearing like simple calcareous concretions, from their minuteness, or rendered less visible by their half transparency.

Their polypi are not sufficiently known to admit a description; the rapidity of their movements renders the difficulty of observing them very great.

These polypidoms are usually found in patches of greater or less expansion, on all marine productions, whether vegetable or solid: they exist in all seas and in all depths.

Their species are distinguished by the form and situation of the opening of their cells, which we may reasonably conclude must be subordinate to the form of the animal.

TRANSPARENT.

1. **Cellepora** *hyalina*. Cells nearly globular, and transparent; opening simple and oblique.

On marine plants of European seas.

BRANCHING.

2. **Cellepora** *ramulosa*. Dichotomous branches, rounded and obtuse. Cells very close, and cylindrical.

Sea of Norway.

BRILLIANT.

3. **Cellepora** *nitida*. Cells merely cylindrical and transparent, marked with rings; opening simple.

Northern seas.

FURROWED.

4. **Cellepora** *sulcata*. Cells bent, projecting, and longitudinally channeled: colour, whitish. Size, scarcely a millemetre.

On the fucus of Australasia.

EGG-SHAPED.

5. **Cellepora** *ovoïdea*. Cells, egg-formed, with each a small round opening; united in a round patch, slightly projecting.—Plate 1. fig. 1.

Found on the fucus of Australasia.

PIERCED.

6. Cellepora *pertusa.* Concretions forming round patches from one to two centimetres in diameter. Cells gibbous, with a small round mouth.

On the Thalassiophytes of European seas.

LIPS-FORMED.

7. Cellepora *labiata.* Cells egg-shaped, rayed, and imbricated: opening large, and formed like two lips, the upper arched, the lower shorter, and more straight. —Plate 1. fig. 2.

Australasia.

8. Cellepora *manguevillana.* Surface of the cells covered with tubercles, invisible to the naked eye; and placed in vertical lines.—Plate 1. fig. 3.

Bay of Cadiz.

WARTY.

9. Cellepora *verrucosa.* Cells in globular or oval masses; openings slightly three-toothed.

European seas.

FOSSIL.

10. Cellepora *megastoma.* Incrustations irregular, but not wide-spreading expansions. Cells very distinct and oval, with a very large opening, and almost central.

On the fossil bodies found in the chalk formation in the vicinity of Paris.

FOSSIL.

11. Cellepora *globulosa.* Incrustations with

very distinct globular cells, that have an oblique opening.

Found situated as the preceding.

RING.

12. CELLEPORA *annularis.* Cells oval, and slightly projecting, forming parallel rings round the stems of the thalassiophytes: opening surrounded by some globular tubercles.

On the *Gelidium concatenatum* of the French coasts.

POUNCE.

13. CELLEPORA *pumicosa.* Rough to the touch, and fragile. Cells globular, with a thorn at the border of their openings.

Variety. Almost without a thorn. In the European seas. Variety from the Cape of Good Hope. On Thalassiophytes.

CRIMSON.

14. CELLEPORA *coccinea.* Cells urceolated, and punctured; opening with a single short tooth, placed on the upper part.

On the coast of Heligoland.

CALIX.

15. CELLEPORA *caliciformis.* Cells nearly oval, with a rugged surface; opening large at the top of each cell, and garnished with several teeth.

On the Thalassiophytes of the bay of Cadiz.

RADIATED.

16. **Cellepora** *radiata*. Cells sub-oval, almost radiated, granulated, and nearly convex; openings half orbicular, bordered with from four to six teeth.

Mediterranean.

FRINGED.

17. **Cellepora** *ciliata*. Cells convex, with the opening usually divided into seven spines.

On the European fucus.

SIXTEEN-TOOTHED.

18. **Cellepora** *sedecim-dentata*. Openings of the cells oval, and longitudinally oblique, with sixteen teeth on the border.

Mediterranean.

TWO-POINTED.

19. **Cellepora** *bimucronata*. Cells oblong and nearly oval; surface rough, with points situated in transverse lines; openings nearly orbicular, with two opposite teeth.

Mediterranean.

COMMON.

20. **Cellepora** *vulgaris*. Cells oval, convex, and alternate; openings half orbicular; lower lip slit, with two holes underneath.

Mediterranean.

ROUND-MOUTH.

21. **Cellepora** *cyclostoma*. Cells oval, alternate, and slightly punctured; openings round and entire.

Mediterranean.

22. Cellepora *Pallasiana.* Cells oval, slightly convex, and punctured; openings round above, and transverse-oblong in the lower part.

Mediterranean.

23. Cellepora *Borniana.* Cells alternate and transparent; the opening an almost four-sided oval, drawn in at two of the sides, and closed by a small membrane slightly punctured.

Mediterranean.

24. Cellepora *otto-mulleriana.* Cells a little convex and opaque; the opening a longish oval, closed by a smooth membrane.

Mediterranean.

[illegible]

FLUSTRA.

Crustaceous Polypidoms, or of a leafy appearance, horny or nearly membranous, consisting of short tubular polypiferous cells, placed at the side of each other, and disposed in regular series on one or more surfaces.

That character of existing union, which, in our introductory history of Polypidoms, we observed was the chief peculiarity by which Polypidoms could be defined, seems to claim an exception with the Celleporas, and also with the Flustras, whose polypi, in their membrano-calcareous cells, appear distinct and unconnected with the animals to whose cells their habitation adheres. There are, however, strong grounds of presumption that the more perfect result of observation will prove them not excluded from what we deem a general and characteristic distinction. When we are better acquainted with the Polypidoms, we shall be more at liberty to observe the Polypi; when the attention is devoted to one object, its peculiarities are more likely to be discovered.

The Flustras vary much in form; sometimes they appear as simple membranes extended on the fucus; others rise in leafy but flat surfaces, lobed or entire, sometimes in verticillated branches, the cells always contiguous, hexagonal or polygonal, and have their partitions perpendicular to the surface on which they are established; the upper part usually convex or hemispherical, and formed of a substance more membranous, thinner, and more transparent than the side partitions, and which usually disappears by drying, sometimes so soon after the death of the animal, that we are inclined to suspect it either forms part of the body or adheres to it.

When the animal of the Flustra has acquired its full growth, it flings from the opening of its cell a small globular body, which fixes itself near the opening, increases in size, and soon assumes the form of a new cell: it is yet closed, but through the transparent membrane that covers its surface, the movements of a polypus may be perceived, who delays not to burst the enclosure of his little habitation; then, exulting in the plenitude of existence, he exercises its functions, and by the assistance of twelve tentacula that surround his mouth, he gives a rotatory motion to the water, and involves in this diminutive whirlpool the animals on which he feeds.

The color of the Flustra is in general a lighter or a darker fawn; sometimes they incline to red, or grey; but they never assume those brilliant hues which are seen in the Corallines and Sertularias.

Left to themselves and without support, I know no species that exceeds two decimetres in height; but attached to the leaves, or surrounding the branches of the great Thalassiophytes, they envelop these in a cretaceous covering, which sometimes extends itself over the whole plant.

The Flustras are found in all seas, and in all depths, on the marine plants of the deepest waters, as well as on those that are scattered on our shores; in the neighbourhood of the polar ices, as well as under the burning sun of the tropics.

The seas of former periods enclosed them in their bosoms, as well as the Cellepores; and their impressions, or their fragments, are discovered in those calcareous rocks that are anterior to chalk formations.

FOLIACEOUS OR LEAFY.

1. FLUSTRA *foliacea.* Branching; divisions fan and other shapes.

Seas of Europe.

TRUNCATED.

2. FLUSTRA *truncata.* Leaf-like and dichotomous; divisions linear and truncated.

Seas of Europe.

PEAR-SHAPED.

3. **Flustra** *pyriformis.* Foliaceous and dichotomous; summits truncated; cells formed like a pyramid, very sharp at the bottom; height about one decimetre; width in the middle of the branches from two to four millimetres.—Plate 1. fig. 4.

Australasia.

CERANOIDOUS.

4. **Flustra** *ceranoïdes.* Flower-like and dichotomous; summits bifid; extremities obtuse; cells long; mouth almost linear, with the border rolled over; height from five to eight centimetres; width in the middle of the branch two or three millimetres.

Australasian sea.

BOMBYCINOUS.

5. **Flustra** *bombycina.* Plant-formed, with obtuse divisions, dichotomous or trichotomous; cells rounded; foot root-formed.

On the coast of Calvados, a reef of rocks bordering on Normandy; and also said to be found in the Indian and American seas.

FLAXEN.

6. **Flustra** *carbasea.* Foliaceous, dichotomous, and obtuse at the summit; cells long and formed pyramidically.

On the coasts of Scotland and Calvados.

CHARTACEOUS.

7. **Flustra** *chartacea.* Foliaceous, digitated, and truncated at the summit; cells four-sided.

Coasts of England and France.

STONY.

8. **Flustra** *petrea.* Foliaceous, fan-shaped, and proliferous; summits rounded; cells alternate, covered with small papillæ, placed on two opposite lines; height from three to four centimetres.

On the Thalassiophytes of Australasia.

TREE-FORMED.

9. **Flustra** *frondiculosa.* Arborescent; divisions obtuse, trichotomous, and crowded; cells placed one above the other.

Indian Ocean.

BRISTLY.

10. **Flustra** *hispida.* Arborescent and spongy; divisions branching; stuck and surrounded with hairs.

Mediterranean sea; very scarce.

VELVET.

11. **Flustra** *pilosa.* Foliaceous or covering Thalassiophytes; the under border of the cells with a bristly tooth.

European seas; usually on the Thalassiophytes, which it sometimes wholly covers, but does not incrustate.

DOWNY.

12. **Flustra** *tomentosa.* Incrustation, soft and velvety; cells scarcely visible.

In the European seas, attached to Thalassiophytes and Sertularias.

LINEAR.

13. **Flustra** *lineata.* Incrustation; cells situated on transverse and oblique lines.

On the Delesseria Palmata, and other marine plants of the European seas.

COMPRESSED.

14. **Flustra** *impressa.* Stony, and membranous; cells nearly rhomboidal, obliquely compressed.

Hab. . . . .

MEMBRANOUS.

15. **Flustra** *membranacea.* Incrustation; cells quadrangular oblongs.

On the fucus of the Baltic sea.

PAPYRACEOUS.

16. **Flustra** *papyracea.* Frondescent, wedge-shaped, with many clefts; cells rhomboidal oblongs, with the summits helmet-shaped.

Mediterranean.

CONCENTRIC.

17. **Flustra** *concentrica.* Incrustation; cells placed on concentric lines; openings small, irregular and rounded.

On the fucus of Australasia.

PEARLY.

18. **Flustra** *baccata.* Incrustation; cells long and gibbous; openings very small.

On the under surface of some marine plants of Australasia and the Antilles.

TUBULAR.

19. **Flustra** *tubulosa.* Incrustation; cells simple,

oval, oblong, and projecting; opening marginated, and nearly pentagonal.

On the Fucus natans.

TOOTHED.

20. **Flustra** *dentata.* Incrustation; but frequently foliated; cells nearly oval, shining, and toothed at the border. with a spine below

European seas.

SQUARE.

21. **Flustra** *quadrata.* Incrustation; cells forming a long regular quadrangle with even borders.

On the Fucus pyriferus.

Variety on the fossils in the vicinity of Paris.

TRIACANTHOUS.

22. **Flustra** *triacantha.* Incrustation; cells oval or round, with two side thorns on the upper part, and one on the lower.

On the Thalassiophytes of Australasia.

MANY-TOOTHED.

23. **Flustra** *multidentata.* Incrustation; cells large and nearly round; opening garnished with many long unequal teeth.

On the fucus of Australasia.

LANIGEROUS.

24. **Flustra** *eriophora.* Incrustation; cells very small, alternate, round at the summit, covered with unequal and numerous hairs.—Plate 1. fig. 5.

On the fucus of Australasia.

MAMMILLARY.

25. **Flustra** *mammillaris.* Incrustation; cells nearly flat, with two obtuse risings at the sides of their opening; colour brown.—Plate 1. fig. 6. a. B.

On the marine plants of Australasia.

SHAGGY.

26. **Flustra** *hirta.* Incrustation; coriaceous and flat; cells rambling and ciliated.

Greenland sea.

SINGLE-TOOTHED.

27. **Flustra** *unidentata.* Incrustation; cells cylindrical, long and large, placed in parallel lines at the side of each other, or in longitudinal lines; opening as large as the cell, with a large tooth on one side of its base.

Australasia.

ITALIAN.

28. **Flustra** *Italica.* Membranous incrustation; cells oval, almost compressed; openings very small, placed at their summit.

Strait of Messina.

SANDY.

29. **Flustra** *arenosa.* Incrustation friable and yellowish; cells simple, ranged nearly chequer-wise.

European seas.

THICK. (FOSSIL.)

30. **Flustra** *crassa.* Very thick incrustation; Cells short and round, with projecting partitions, the upper part depressed; openings large and crescent-formed.

On an oyster and other fossils found near Ghent.

TESSELLATED. (FOSSIL.)

31. **Flustra** *tessellata*. Incrustation, thick; partitions rounded in the fore part; openings in front, small and nearly round; top of the cells flat and thick, of an ivory white, and very shining.

On the fossils of the chalk in the vicinity of Paris.

CRETACEOUS. (FOSSIL.)

32. **Flustra** *cretacea*. Thick incrustations, with long oval cells.

On fossil shells in the vicinity of Plaisance, analogousto the MurexTritonis of our seas.

RETICULAR. (FOSSIL.)

33. **Flustra** *reticulata*. Rather thick, forming free expansions, celluliferous on both surfaces; cells oval and long, the partitions very projecting; openings middling in size, and rather transversal.

In the sand near Valogne in France, with Baculites and Belemites.

BIFURCATED. (FOSSIL.)

34. **Flustra** *bifurcata*. Foliaceous, dichotomous expansions, bifurcated at the summits, and garnished with hexagonal cells on both surfaces.

At Grignon, and in a lime-stone at Cerithes.

BOTTLE-SHAPED. (FOSSIL.)

35. **Flustra** *utricularis*. Incrustation in very spreading expansions; cells oval and a little flattened, larger at the back, with rather a small opening placed in front.

On the fossils of the chalk in the vicinity of Paris.

SMALL-MOUTHED. (FOSSIL.)

36. Flustra *microstoma*. Rather thick incrustation, with cells not very distinct, oval, and rather prominent; the opening in the middle, very round and small.

On the large fossil oyster in the vicinity of Sceaux.

DEPRESSED.

37. Flustra *depressa*. Cells oval, alternate, horizontal, and slightly punctured; openings half-moon shaped, and closed with a valve.

Adriatic.

DISH-SHAPED.

38. Flustra *patellaria*. Cells oval, flat above and convex below; nearly isolated, horizontal, and subalternate.

Mediterranean.

OBLATE.

39. Flustra *planata*. Cells oval, flat, alternate, and distant, bordered and closed by a membrane.

Mediterranean.

The succeeding genera belonging to this Order have hitherto been included in the general denomination of Cellarias: but their varieties induced me to separate them into families; whose species are indeed few, but which will probably be augmented when these little beings shall have been more attentively studied.

These Polypidoms are plant-like, frequently articulated, either flat, compressed, or cylindrical. Cells

F. setacea,
F. [illegible]
F. [illegible]
distans

communicating together underneath, with one or more bristly appendages on the outside, having their opening generally on the same surface. They have no distinct stem.

PHERUSA.

FRONDESCENT Polypidom with many clefts. Cells oblong, projecting, and placed only on one surface; openings irregular.

The Pherusas differ so materially from the Flustras, that an eye the least exercised cannot possibly confound them with the numerous species of that genus, nor with the Celleporas; though, like the latter, they have distinct projecting cells, but not isolated like them, as the Pherusas communicate at their base. They are equally removed from the Flustras by the situation of their cells; in this latter, when the Polypidom is frondescent or foliated, the cells are found on both surfaces; in the Pherusa they are always placed on the upper surface, the under part being perfectly devoid of them, but shining and marked with nerves, corresponding to the partitions at the base of the cells.

The Polypidoms of this genus have tubular cells, projecting in the upper part, large and compressed below: the opening is large, and usually irregular, with the border turned in, perhaps resulting from desiccation. Those at the extremity of the branches are nearly straight; the others become less so in proportion as they approach the base.

Their substance is almost wholly membranous and flexible. Colour generally a deep brown. Their size never exceeds eight centimetres. The only species yet known belonging to this genus is often met with on the marine productions of the Mediterranean; they are found attached to plants, polypidoms, and rocks.

PHERUSA *tubulosa.* Oblong, tubular, and projecting cells, having their opening on one surface.—Plate 2. fig. 1. a. B. C.

ELECTRA.

POLYPIDOMS branching; cells campanulated, ciliated on their border, and verticillated.

This genus consists of but a single species, whose cells are verticillated round a pulpy centre, or adhere to some Thalassiophyte, usually cylindrical. The rings are in general so close as to make them appear imbricated.

The Electra is very common in the European seas; when the polypi are alive, their colour is a red-violet of greater or less brilliancy; but when exposed to air and light, it becomes an earthy white.

VERTICILLATE.

ELECTRA *verticillata.* Cells campanulated, ciliated in their borders, and placed in rings one above the other.—Plate 2. fig. a. B. 2.

European seas.

ELZARINA.

FRONDESCENT Polypidoms; dichotomous, cylindrical, and not articulated. Cells large and dispersed, scarcely projecting; openings oval.

The only species comprised in this genus resembles a small cylindrical fucus, branching or dichotomous.

The substance is nearly membranous. Colour brown, more or less dark.

They never exceed four centimetres in height; the diameter of the branches varies from one to two millimetres; the higher ones are sometimes in the form of clubs.

ELZARINA *Blainvillii.* Cells membranous, large and dispersed.—Plate 2. fig. 3. a. B.

On the Thalassiophytes of Australasia and of the isle of Timor.

CELLARIA.

PLANT-LIKE Polypidom, cartilaginous, stony, cylindrical, and branching. Cells dispersed on the whole surface.

The Cellarias are always articulated, cylindrical, dichotomous or branhcing; covered with dispersed cells, having a large polygonal opening. Their substance is almost wholly calcareous, which renders them very fragile and very little flexible.

When first taken from the sea, their colour is sometimes a bright red, and sometimes a more or less brilliant yellow; in the collections some are white, and some yellowish.

They never exceed a decimetre in height.

They appear always fixed to rocks or other hard marine bodies; I have never observed any on the leaves or branches of the Thalassiophytes.

HAIRY.

1. CELLARIA *hirsuta.* Articulated, dichotomous or branching; articulations cylindrical, very small at their extremities, covered with dispersed cells and numerous long articulated hairs; straw colour; a decimetre high.—Plate 2. fig. 4. a. B.

SALICORNINE.

2. CELLARIA *salicornia.* Stem articulated and dichotomous; articulations nearly cylindrical, interspersed with plain rhomboidal cells.

Seas of Europe and Asia.

SALICORNOIDOUS.

3. CELLARIA *salicornoïdes.* Very small and branching.

Mediterranean.

N. B. This species is very distinct from the last, but easily confounded with it.

CEREOUS OR WAXEN.

4. CELLARIA *cereoïdes.* Stem branching; articulations nearly cylindrical, interspersed with cells terminated by projecting orifices.

Mediterranean and Indian seas.

FILIFORM.

5. CELLARIA *filiformis*. Articulations filiform, very fine, and quadrangular; cells alternate.

Indian Ocean.

CABEREA.

FRONDESCENT Polypidom, cylindrical or a little compressed; cells on one surface, the opposite side furrowed; furrow longitudinal, straight, and pinnated.

The substance of these Polypidoms is more calcareous than membranous.

Their colour is yellow fawn, more or less brilliant.

Their size varies from four to six decimetres.

They are never parasites on marine plants; it is by numerous fibres, and, not by a base, that they fix themselves on the rocks and solid Polypidoms of Australasia.

PINNATED.

1. CABEREA *pinnata*. Stem pinnated and cylindrical, as are also the branches; pinules or branches alternate, cells in united formation, usually two together; furrows transverse. Colour yellowish: height seven or eight centimetres.

Australasia.

DICHOTOMOUS.

2. CABEREA *dichotoma*. Branches dichotomous and compressed. Cells small and numerous, convex on the back of the Polypidom, where they produce a longitudinal furrow, with alternate and diverging furrows.

Hairs numerous, rather long, and bent towards the branches.—Plate 2. fig. 5. a. B. C.

Australasia.

CANDA.

FRONDESCENT, fan-shaped, and dichotomous Polypidom. Branches united by small lateral and horizontal fibres. Cells alternate, united, placed on only one surface, and not projecting.

Description can give but an imperfect idea of the appearance of this Polypidom, or of the effects produced by its dichotomous branches, united by side and horizontal fibres, which connect all the parts of this beautiful polypous production.

It is probable that in their living state their colours are very bright; but desiccation has diminished some, and destroyed many others.

Their substance is membranous, horny, cretaceous, and friable.

Their height varies from three to four centimetres.

CANDA *arachnoïdes,* Plate 2. fig. 6. a. B. C. D.

On the rocks of Timor.

ACAMARCHIS.

DICHOTOMOUS Polypidom. Cells united and alternate, terminated by one or two lateral points, with a vesicle at their opening.

The vesicles are nearly globular; in form they resemble military casques, and are placed on the borders of the cells, which they appear wholly to close; they are sometimes wanting, nor is it rare to find Polypidoms entirely deprived of them. Various have been the opinions respecting their purpose: I am inclined to consider them as ovaria enclosing the germs of future individuals; having observed that these vesicular bodies are sometimes whole, and in this case I have always found them filled with small globular bodies. It appears that these ovaria open by a transversal slit; whenever this is met with, the ovaria are found empty.

The Acamarchis resemble each other in form; they differ by the number of the teeth that are placed on the external side of the cells, and by the form of the latter, whose border is either smooth or toothed: the upper membrane of the cells is frequently wanting, and it was in this state that Ellis figured his first species.

The substance of the Acamarchis is more horny than cretaceous.

Their colour is a dull green, or greyish, which changes to a fawn, more or less bright, by desiccation, or exposure to air and light.

Their size never exceeds a decimetre, and is usually much less.

They attach themselves by numerous fibres to solid marine productions; they are found in the equatorial and temperate seas of either world.

NERITAL.

1. ACAMARCHIS *neritina*. A single tooth on the external side of the cells.—Plate 3. fig. 2. a. B.

Mediterranean.

TOOTHED.

2. **Acamarchis** *dentata.* Two teeth on the external side of the cells; opening toothed. Plate 3. fig. 3. a. B.

Australasia.

CRISIA.

Plant-like Polypidom. Dichotomous or branching; cells slightly projecting, alternate, rarely opposite, with their opening on the same surface.

All the Crisias have so much analogy of form with each other, that these Polypidoms are easily to be distinguished.

Their substance is in general calcareous, with articulations more or less horny.

In the dried specimens, the colour slightly varies; it is usually a dirty white, but sometimes quite pure, and at others tinged with yellow or violet. Their height is generally from four to six centimetres; in some species it reaches to a decimetre, but I never met with any exceeding that size.

The Crisias, unlike the Cellarias, which shun the Thalassiophytes, exclusively prefer these vegetables, which they embellish with their white cretaceous tufts: they are found, in the warm and temperate regions, at all seasons of the year; but in the colder climates, they are rarely found during winter; and their existence in all places appears to depend on the marine plant to which they are fixed.

IVORY.

1. **Crisia** *eburnea.* Upright, articulated and branching; cells alternate, truncated, and slightly projecting; ovaria gibbous.

European seas.

CILIATED.

2. **Crisia** *ciliata.* Cells almost lateral, alternate; the opening large and oblique, garnished with numerous hairs unequal in length.

European seas.

HAIRY.

3. **Crisia** *pilosa.* Stem upright and dichotomous, cells oblique; the opening garnished with one or two long flexible hairs.

Mediterranean.

RUGGED.

4. **Crisia** *scruposa.* Rampant and dichotomous; cells united and alternate: the opening oval, and bare.

Seas of Europe, Asia, and America.

THORNY.

5. **Crisia** *muricata.* Stem articulated and dichotomous. Cells alternate, and garnished on their upper part with some sharp tubercles; the opening toothed; teeth silky. Colour, a dull white; height about one centimetre.

On the Fucus Horneri in the seas of Japan.

RAMPANT.

6. **Crisia** *reptans.* Articulated, dichotomous, and

rampant: opening of the cells garnished with two hairs of unequal length.

European seas.

MAILED.

7. Crisia *loriculata*. Very branching and dichotomous. Cells opposite; opening obliquely truncated.

Seas of Europe.

BIRD'S HEAD.

8. Crisia *avicularia*. Stem upright and dichotomous; ciliated at the border of the cells, with a vesicle in the form of a bird's head.

European seas.

FLUSTRAL.

9. Crisia *flustroïdes*. Frondescent, flat, and dichotomous; summit truncated; cells long, with two small teeth on the inner border.

On the Millepora, otherwise Flustra foliacea, on the coasts of Calvados.

TERNARY.

10. Crisia *ternata*. Branching, dichotomous, articulated, and rampant; articulations angular, almost turban-shaped; cells in threes, unilateral.

Scotland.

THREE-CELLED.

11. Crisia *tricyttara*. Frondescent, dichotomous, and articulated; cells oblong oval, larger above than below, usually placed two on the same line, sometimes three: colour greyish yellow; height about five centimetres.—Plate 3. fig. 1. a. B. C.

On the fucus of Australasia.

FEATHERY.

12. **Crisia** *plumosa*. Stem very branching, upright and dichotomous; cells unilateral, alternate, and terminated at the summit by a point.

European seas.

C. denticulata
aculeata
geniculata

MENIPEA.

Plant-like Polypidom; branching and articulated; cells having their opening on the same side, and many united together in concatenated masses.

The general appearance of the Menipeas, and the singular form of their cells, give them a distinct and peculiar character. Their branches bend in the form of plumes, and instead of straightening, curve still more when put into water. Their cells, more or less numerous, are placed in masses of a triangular form, and linked one to the other, having their opening always on the same side and in parallel lines; there are generally three placed on the larger part of the wedge, two on the second line, and then a single one terminating this reversed pyramid; sometimes there are only two rows of cells, and even a single one placed at each articulation. The Menipeas bifurcate at each articulated mass.

Their substance appears more calcareous than membranous or horny; they are very friable, and preserved with difficulty.

Their colour is a yellowish white, bordering on grey.

Their height never exceeds a decimetre.

The Menipeas are found at the base of marine plants, or on the solid polypidoms of the equatorial seas, and attach themselves by numerous fibres.

CURLED.

1. **Menipea** *cirrata*. Stem very branched, dichotomous, and curved inwardly; articulations nearly oval, and ciliated on their external side.

Indian ocean, and Mediterranean.

FAN-SHAPED.

2. **Menipea** *flabellum*. Stem branching and dichotomous; articulations of an angular form, entire, truncated at both ends.

Indian and American seas.

WOOLLY.

3. **Menipea** *floccosa*. Stem very branching and dichotomous; articulations nearly cuneiform, and slightly toothed at the edges.

Indian ocean.

GLASSY.

4. **Menipea** *hyalæa*. Articulations convex, smooth and shining underneath; flat or concave on the side where the cells open; subcuneiform, thin at the edges, and terminated above by two prickly appendages: colour yellowish fawn; height a decimetre.—Plate 3. fig. 4. a. B. C. D.

Indian seas.

EUCRATEA.

A PLANT-LIKE articulated Polypidom; each articulation composed of a single cell, simple and curved; opening oblique.

The cells of the Eucrateas, always simple, isolated and articulated one to the other, have a more or less arched form; the curves they form, whether concave or convex, are always on the same side of each branch; the openings are oblique, and placed in the upper part of the concavity of the cells, which are all provided with a filiform appendage of greater or less length, whose situation varies frequently on the same Polypidom. The form of the Eucrateas is in general elegant.

Their substance is not very flexible, being more calcareous than membranous: this circumstance, and the extreme tenuity of the lower part of the cells, renders them very fragile.

Their colour in a state of desiccation is either pure white or brownish fawn.

Their height never exceeds three or fourcentimetres.

They are found on the Thalassiophytes and other marine productions of the European seas.

HORNED.

1. EUCRATEA *cornuta.* Hairs longer than the cells, and issuing from the articulations.

European seas.

CLAWED.

2. EUCRATEA *chelata.* Very fragile; cells in the

form of a horn, with an oblique opening, having a cil shorter than the cell. Plate 3. fig. 5. A.

European seas.

AETEA.

Polypidom, with a rampant and branching stem; cells solitary, opaque, and tubular, in the form of clubs, and arched; opening at the side.

This Polypidom appears to unite the present Order with that which follows, having a rampant stem from which the cells issue; but it differs essentially from the second Order, in the form of its undulated stem, which is branched and swelled at stated distances, and also in the form of its cells; it is therefore truly an intermediate species.

This genus as yet comprises only one species, very common on the marine plants of the European seas; they embellish these vegetables by the pearly whiteness of their cells, which forms a beautiful contrast with the brilliant red of the Plocamis, on which the Aëtea anguina is frequently found: one might imagine them many-clefted leaves of red coral, covered on all parts with hairs of silvery white.

SERPENTINE.

1. Aetea *anguina*. Described in the genus: is found both in the European and Australasian seas.—Plate 3. fig. 6. A.

CLASS 1.—ORDER II.

Cells of distinct formation, but uniting together, and coalescing with the stem.

Plant-like Polypidoms with a distinct stem, which is either simple or branching, very rarely articulated, but generally a hollow tube, filled with a gelatinous animal substance, into which the lower part of every polypus is inserted that inhabits a cell, whose situation, form and size vary with the individual that inhabits it.

GENERA AND SPECIES.

PASITHEA.

PLANT-LIKE Polypidom, a little branching, and articulated. Cells in threes or verticillated; sessile or pedicellated at each articulation.

The two known species, which form the genus Pasithea, bear so strong a resemblance to each other, that the naked eye can with difficulty distinguish them; it is necessary to employ a glass to observe them well.

Their substance is much more horny than calcareous.

Their colour is a dull yellow, more or less deep.

Their size varies from one to three centimetres.

They are generally found on the fucus natans, or some other Thalassiophytes of the equatorial seas.

They are rarely to be found in collections.

TULIP-FORMED.

1. **PASITHEA** *tulipifera.* Articulations in the form of clubs; cells three in number, united on one pedicle. —Plate 3. fig. 7. A.

American seas, principally on the Jamaica coast.

FOUR-TOOTHED.

2. **PASITHEA** *quadridentata.* Rampant, cells verticillated, four and four, with an odd one; that in the centre frequently proliferous.—Plate 3. fig. 8. a. B.

On the fucus natans.

AMATHIA.

BRANCHING Polypidom; cells long and cylindrical, united in one or many groups.

The Amathias, by their numerous cells, their horny and hollow stem, filled in a living state with a gelatinous and irritable substance, show the general character of the Order; they differ, however, from their neighbouring genera, by their aspect, their ramifications, and also the form and respective situation of their cells. In some species the cells are united in isolated groups, resembling Pan's flute with cylindrical reeds varying in their length; in others all the groups touch, but can easily be distinguished by the unequal length of their cells: some of them have their polypous cavities united at the sides, forming spiral and projecting lines round the stems, to which they adhere by their lower part; in fine, there are some in which these lines cease to project forward, and are attached to the stem by the back part of the cells. Therefore, notwithstanding the apparent difference between the Amathia *lendigera*, and the A. *spiralis*, it is impossible to place them in separate genera, on account of the intermediate species which gradually link together beings at first sight exceedingly dissimilar.

No distinct character can be formed from the distance which separates these cellular groups from each other; in the Amathia *lendigera*, so common in our seas, we find individuals in which all the groups of cells touch, and others in which those same groups are distant two or three millimetres from each other. It is in the number and the form of the cells of each group, in their situation, ramification, &c., that we find the means of distinguishing the species.

The Amathias are of a horny substance, very slightly cretaceous.

Their colour is a brown fawn, more or less deep.

They vary in height from one to fifteen centimetres.

They are frequently found parasites on the Thalassiophytes; sometimes they adhere to rocks or other hard marine productions by a fibrous base.

They appear more common in the equatorial and temperate seas, than in the cold or icy regions of either pole.

LENDIGEROUS.

1. AMATHIA *lendigera*. Branching and filiform; cells with an even border; groups at unequal distances, sometimes very wide apart.

European seas.

HORNED.

2. **Amathia** *cornuta.* The largest cell of each group has a free unattached border, garnished with two setaceous appendages.—Plate 4. fig. 1. a. B.

On the fucus of Australasia.

UNILATERAL.

3. **Amathia** *unilateralis.* Branches curved inwardly ; groups of the cells almost all touching, and placed on the same side.

Mediterranean.

ALTERNATE.

4. **Amathia** *alternata.* Very branchy; groups of cells very long, placed alternately, and very close upon the branches; cells numerous, and of nearly the same size.

American seas.

CONVOLUTED.

5. **Amathia** *convoluta.* All the cells united and forming one group, projecting, and spirally surrounding the stems and branches.

American seas.

SPIRAL.

6. **Amathia** *spiralis.* Branching and dichotomous ; cells forming only one group, spirally surrounding a centre, and adhering by their inner surface. —Plate 4. fig. 2. a. B.

Australasian seas.

NEMERTESIA.

Plant-like and horny; garnished through its whole extent with small polypiferous cils, curved towards the stem, and verticillated; cells placed on the inner part of the cil.

The Nemertesias, not numerous in their species, are distinguished from the Sertularias, with which they have hitherto been classed, by a variety of characters that belong to them exclusively, and which do not allow us to confound them with any of the genera which compose that Order.

These Polypidoms are sometimes branching, sometimes not branching; in the latter case, their general appearance resembles a mouse's tail; in the first case, they cannot be compared to any thing, their aspect is peculiarly their own.

Their cells are invisible to the naked eye, bare, and always placed on the interior part of the cils, a single one at each articulation.

The numerous ovaria are axillary to the cils and stem.

The substance of the Nemertesias is membranous, horny, and very flexible; they become almost transparent by desiccation.

Their colour, when first taken from the sea, is a beautiful citron-yellow, sometimes orange; they become dull and whitish when exposed to the air and light.

Their height varies from two to five decimetres.

The Nemertesias are never parasites on marine plants; they are almost always found attached by long and numerous filaments to the solid sands or rocks of the Mediterranean and European oceans; they seem to prefer deep waters.

ANTENNINE.

1. NEMERTESIA *antennina.* Ramifications verticillated, simple and setaceous; stem simple or very little branched.

European seas.

N. B. It is a rare thing to find this species branched; and when so found, the number of branches is confined to one or two, seldom more.

JANINE.

2. NEMERTESIA *Janini.* Stem a little branching; verticils very distant from each other; slender bristles, very long.—Plate 4. fig. 3. a. B. C.

Bay of Cadiz.

BRANCHING.

3. NEMERTESIA *ramosa.* Stems branching; verticils approximate.

European seas.

AGLAOPHENIA.

PLANT-LIKE and horny; furnished through the whole length, and on the same side, with axillary or isolated cells.

The Aglaophenias have been confounded with Sertularias by all authors who have written on Polypidoms, notwithstanding the numerous and invariable characters which constitute them a very distinct group.

Their small polypean lodges are sometimes placed between two appendages, like a flower in its calix; at other times the upper appendage is wanting, and the lower one may then be compared to the bractea of an axillary and sessile flower. There are some, of which the cells are isolated and placed at regular distances from each other; others, which by their near approach form groups at each articulation. But through all the species the generic character is constantly found, i. e. that of having the cells on the same side of the branches.

The Aglaophenias are of a horny substance, membranous, and flexible.

Their colour, which is fawn, varying almost from black to white, presents not, indeed, those brilliant hues that adorn some of the Sertularias, or some of the Corallines; but they excel those Polypidoms in the elegance of their form and in the situation of their branches, arching gracefully over each other, and resembling the waving plumes of the ostrich in their divisions and general inflection.

Their height varies from one centimetre to three decimetres, or even more.

They are found in all seas, at all depths, and in all latitudes; frequently parasites on the Thalassiophytes and other marine productions; sometimes adhering to rocks by fibres more or less numerous.

HOOKED.

1. **Aglaophenia** *angulosa.* Stem angular, and slightly flexuous; branches dispersed, and pinnated; divisions opposite; cells in the form of a cupola, with an appendage below, rather long, and arched; height three decimetres.

Australasia.

SPIKED.

2. **Aglaophenia** *spicata.* Stem cylindrical, a little cretaceous, and upright; branches alternate, pinnated, numerous, straight, and in the form of thorns; cells campanulated, with the lower appendage like a calix; height from two to three decimetres.

Indian Ocean.

FLEXUOUS.

3. **Aglaophenia** *flexuosa.* Stem cylindrical, flexuous, and branching; branches curved above, as well as the pinules; cells toothed, and longer than the lower appendage; height from twelve to fifteen centimetres; colour, a bright fawn.

Eastern Ocean.

ARCHED.

4. **Aglaophenia** *arcuata.* Stem branching, and dichotomous; branches arched, but not numerous; cells placed between two appendages; the lower one formed like an elbow, with two opposite teeth, placed in the angle of the bend; the upper very short: colour, a deep but bright fawn; height from twelve to fifteen centimetres.—Plate 4. fig. 4. a. B.

Western Ocean.

WINGED.

5. **Aglaophenia** *pennaria.* Stem branching, and bent; cells nearly campanulated; the border toothed with pointed teeth.

Mediterranean.

MULTIFOLIOUS.

6. **Aglaophenia** *myriophyllum.* Stem simple; cells campanulated; border generally entire.

Seas of Europe.

FEATHERED.

7. **Aglaophenia** *pennatula.* Cells campanulated and truncated; borders toothed; two opposite teeth longer than the others.

Indian seas.

ELEGANT.

8. **Aglaophenia** *elegans.* Stem dichotomous; pinules alternate, numerous, long, and setaceous; cells with a short and sharp appendage; colour, a brilliant yellow fawn; height about a centimetre.

Indian Ocean.

CYPRESS.

9. **Aglaophenia** *cupressina.* Stem upright, cylindrical, scaly, and very branching; branches opposite, and pinnated; pinules short and stiff; cells shallow, and nearly without the lower appendage; ovaria oval, and placed at the middle of the branch; colour, an olive brown; size from twelve to fifteen centimetres.

East Indies.

CRUCIFORM.

10. **Aglaophenia** *crucialis.* Stem upright, and not

much branching; branches opposite, and diverging; colour, a bright fawn; height from one to two decimetres.

Seas of Australasia.

PLUMED.

11. **Aglaophenia** *pluma.* Cells slightly gibbous and toothed; ovaria denticulated at the edges with transverse and oblique rings, on the side of the stem.

European seas.

MARINE.

12. **Aglaophenia** *pelagica.* Stem simple; cells oval, with a small opening; ovaria oval, smooth, and shining on the surface; height about a centimetre.

On the fucus natans.

BEAUTIFUL.

13. **Aglaophenia** *speciosa.* Cells only on one side, campanulated, toothed, and with stipulas; branches pinnated and curved.

Coasts of Ceylon.

GLUTINOUS.

14. **Aglaophenia** *glutinosa.* Root in fibrous branches; stem simple, and pinnated; pinules approximate, and alternate; cells without visible appendage; colour, a bright and brilliant red; height from six to eight centimetres.

Indian and Australasian seas.

DELICATE.

15. **Aglaophenia** *gracilis.* Stem simple, and pin-

nated; pinules setaceous, few, dispersed, and upright; cells invisible to the naked eye, distant from each other, and without appendages; of a bright rose colour; height about a decimetre.

Indian Ocean.

BRISTLY.

16. **Aglaophenia** *setacea.* Cells very remote and very small; ovaria axillary, tubular, and oblong.

European seas.

PINNATED.

17. **Aglaophenia** *pinnata.* Stem simple and pinnated; pinules alternate, and arched; cells half campanulated.

Indian and European seas.

SECONDARY.

18. **Aglaophenia** *secundaria.* Cells campanulated; ovaria axillary; stem curved.

Mediterranean.

FRUTICANT.

19. **Aglaophenia** *frutescens.* Cells cylindrical, campanulated, with a small thorn on the interior border.

English coast.

HYPNOTIC.

20. **Aglaophenia** *hypnoïdes.* Cells campanulated, terminating in a beak; border with five teeth.

Indian Ocean.

AMATHUSIAN.

21. **Aglaophenia** *Amathioïdes.* Stem branching;

cells simple, of a long oval form, united in groups of from three to six, but not coalescing with each other; ovaria of a pyramidical form; height from one to two centimetres.

Bay of Cadiz.

FALCATED.

22. Aglaophenia *falcata.* Stem branching, and flexuous; cells tubular, bulging, and imbricated; ovaria dispersed and oblong.

European seas.

DYNAMENA.

Plant-like, cartilaginous, somewhat branching, garnished through the whole extent with cells in pairs and opposite.

The Dynamenas are distinguished from the other genera of their order by their minuteness, their sessile and opposite cells, and their mode of ramification; characters which are not found in the other Polypidoms of this order. The cells are sometimes so transparent, that they can only be perceived by a strong magnifier, when they first leave the sea, and the polypi are yet alive. One is then tempted to imagine them naked polypi, fixed to their stem by a pedicle of greater or less length; but we soon recognise the cell which serves for a retreat to the animalcula; and in the Polypidoms preserved in collections these are often seen at the bottom of the cell, dried, in the form of a little opaque globule.

The substance of the Dynamenas is membranous or horny.

In the bosom of the sea they are adorned with brilliant colours, which fade or disappear by exposure to air and light.

All the species, with the exception of the Operculata, scarcely reach a few centimetres in height, although their growth appears rapid: they are usually parasites on the Thalassiophytes, or the other marine productions of the different seas that cover the face of the globe.

OPERCULATED.

1. **Dynamena** *operculata.* Cells oval, and closed by a lid terminating in a sharp point.

Seas of Europe and America.

WILD PINE.

2. **Dynamena** *pinaster.* Stem simple, pinnated; pinules alternate; cells curved.

EVANS'S.

3. **Dynamena** *Evansii.* Branches opposite; cells very short; ovaria lobed and opposite.

Coast of England, near Yarmouth.

SERTULARIOUS.

4. **Dynamena** *sertularioïdes.* Stem thick, short, and branching; branches alternate; cells often nearly al-

ternate; border entire; height from two to three centimetres; colour brown.

On the Thalassiophytes and Polypidoms of Australasia.

ROSY.

5. **DYNAMENA** *rosacea.* Cells tubular; border oblique; ovaria in the form of a flower with six divisions, pointed, unequal, and curved.

European seas.

BEARDED.

6. **DYNAMENA** *barbata.* Stem dichotomous; cells with an oval mouth, the borders of which are garnished with very long cils; colour whitish; height about two centimetres.

On the fucus of Australasia.

PURSE-SHAPED.

7. **DYNAMENA** *bursaria.* Stem branching, and articulated; cells transparent and carinated.

European seas.

DWARF.

8. **DYNAMENA** *pumila.* Cells campanulated and gibbous; inner border long and pointed.

On the plants and Polypidoms of the Atlantic Ocean.

OBLIQUE.

9. **DYNAMENA** *obliqua.* Stem simple and upright; cells oval and a little arched; the opening so oblique as to appear almost perpendicular; colour, deep fawn; height one, or one and a half centimetres.

On the fucus of Australasia.

DISTANT.

10. **Dynamena** *distans.* Cells very distant from each other, with border entire; colour whitish, and a little transparent; height about one centimetre.—Plate 5. fig. 1. a. B.

On the fucus natans and other marine productions of the Atlantic.

TURBINATED.

11. **Dynamena** *turbinata.* Root rampant; stem simple, and upright; cells rather long, with a wide open mouth, and border entire; colour, a yellow fawn; height about one centimetre.

On the Australasian fucus.

DIVERGENT.

12. **Dynamena** *divergens.* Stem flexuous; branches diverging, and alternate, almost at right angles with the stem; cells with a toothed border; colour, yellow fawn; height a centimetre.—Plate 5. fig. 2. a. B.

On the fucus of Australasia.

BIFORM.

13. **Dynamena** *disticha.* Stem simple, upright, and articulated; cells scarcely visible, almost triangular, with the extremity curved.

On the fucus natans.

MARINE.

14. **Dynamena** *pelagica.* Stem composite, and flexuous; branches alternate; cells tubular, with an horizontal border.

On the fucus natans.

SERTULARIA.

A PLANT-FORMED Polypidom, branching; stem usually flexuous or in zigzag; cells alternate.

The form of the Polypidoms which I have united in the family of the Sertularias varies considerably: some have their branches dispersed, and form almost paniculated stems; there are some whose stem is upright with flexuous branches; a great number have their branches straight upon a flexuous stem: finally, there are some whose divisions are dichotomous and divergent, and which break, when dry, on the slightest attempt to bend them.

The substance of the Sertularias is horny-membranous; with sometimes a slight cretaceous incrustation on the lower part of the Polypidom.

Their colour, in general agreeably shaded, does not equal the Corallines in brilliancy of tints. This colour varies from white to a fawn, from rose-colour to a tarnished green.

They greatly differ in size; some scarcely reaching a centimetre, while others raise their branches many decimetres high.

They are found in all seas, and in all latitudes.

FIR.

1. SERTULARIA *abietina*. Cells oval, tubular, with a border entire; bulging towards the stem.

European seas.

PECTINATED.

2. SERTULARIA *pectinata*. Base or root branch-

ing; stem simple, pinnated; branches very long; cells very small, with a border entire; ovaria inclining to oval, and rather large; colour deep brown; size about a decimetre.

THREE-TOOTHED.

3. SERTULARIA *tridentata*. Base branching; stem straight and pinnated; pinules diverging; cells with three teeth on their border, the opening oblique; colour yellowish; height from four to six centimetres.

Australasia.

TAMARISK.

4. SERTULARIA *tamarisca*. Cells tubular, with three or four teeth on the border; ovaria compressed as if truncated, with a thorn at each side.

Northern and Mediterranean seas, &c.

FERN.

5. SERTULARIA *filicula*. Stem flexuous; branches articulated; cells tubular at the summit.

European seas.

TOOTHED.

6. SERTULARIA *dentata*. Stem branching; cells pyriform, with a toothed border; ovaria oval, border of the opening blackish; height two centimetres.

Bay of Cadiz.

ELONGATED.

7. SERTULARIA *elongata*. Base branching; stem usually simple, pinnated, but rarely bipinnated; branches situate at the upper part of the stem; cells approximate, and small, with ciliated borders; ovaria oval, truncated at the summit, compressed, with two

pointed lateral appendages; colour, a reddish green; height, from one to two decimetres.—Plate 5. fig. 3. a. B. C.

Australasia; also on the English coast, as well as the Pectinata.

Nota. This Sertularia is remarkable for its elegance.

CLIMBING.

8. SERTULARIA *scandens.* Principal stem filiform, with very few cells, and climbing upon Gorgonias or other marine productions; secondary stems numerous, simple, dispersed, and pinnated; cells with a toothed border; ovaria oval, truncated, and bicornous; colour inclining to rose; height from two to four centimetres.

Australasia.

ZONED.

9. SERTULARIA *polyzonias.* Cells oval; border with four slightly projecting teeth; ovaria inclining to oval, marked with transverse zones.

European seas.

RIGID.

10. SERTULARIA *rigida.* Dichotomous; branches diverging and fragile; cells distant, rather large, and conical; opening oval, with a point on the external border; colour greenish grey; size from three to four centimetres.

Australasia.

DISTANT.

11. SERTULARIA *distans.* Stem slightly ramified; cells campanulated, very distant from each other, and gibbous; opening contracted and toothed; height from one to two centimetres.

Australasia.

SHINING.

12. **Sertularia** *splendens*. Stem branching and articulated ; two cells, alternate at each articulation; cells nearly cylindrical; opening with three teeth, the one on the external border much longer than the side ones; ovaria nearly cylindrical; height from two to four centimetres.

Bay of Cadiz.

SHRUBBY.

13. **Sertularia** *arbuscula*. Root forming a large base; stem thick, short, and branching from its base; branches and shoots numerous, short, and scattered: cells small, campanulated, bulging, and entire at their border; ovaria long and oval, with a small opening at the summit; colour deep brown; height from four to six centimetres.—Plate 5. fig. 4. a. B. C.

Seas of Australasia.

CYPRESS.

14. **Sertularia** *cupressina*. Cells tubular and adhering through all their length; external border of the opening higher than the inner.

European seas.

SILVER.

15. **Sertularia** *argentea*. Cells pyriform; branches alternate and panicled.

Seas of England and America.

ARBOR VITÆ.

16. **Sertularia** *thuja*. Cells in two rows and

compressed; ovaria nearly of an oval form, and bordered; branches dichotomous, and in rows.

European seas.

CYPRESS-FORMED.

17. SERTULARIA *cupressoïdes*. Cells scarcely projecting, simple, and obliquely truncated; vesicles oval; branches dichotomous, articulated, and dispersed.

White sea.

MISENIAN.

18. SERTULARIA *Misenensis*. Very branching, and dichotomous; cells alternate, small, and diverging; ovaria oval, pedunculated, and axillary.

Mediterranean, near Misena.

LICHEN.

19. SERTULARIA *lichenastrum*. Stem pinnated and articulated; cells imbricated in two rows.

European seas.

CLUSTERED.

20. SERTULARIA *racemosa*. Stem upright, cylindrical, and branching; branches almost arched; cells dispersed; ovaria branching.

Mediterranean.

DUSKY.

21. SERTULARIA *fuscescens*. Cells nearly opposite, and tubular; ovaria approximate, small, and with three tubercles.

Coast of Cornwall.

SPIKED.

22. SERTULARIA *spicata*. Stem tubular, panicled, and marked with rings; branches very close, verticil-

lated, and trichotomous; cells in threes, cylindrical, with a very small opening; ovaria oval, and axillary.

BLACK.

23. SERTULARIA *nigra*. Cells nearly opposite, and very small; ovaria very large, oval and quadrangular; branches pinnated and black.

Indian and American seas; and coast of Cornwall.

CEDAR.

24. SERTULARIA *cedrina*. Cells nearly cylindrical, tubular, and imbricated, in four rows; branches quadrangular, and largest at the summit.

Sea of Kamtschatka.

PURPLE.

25. SERTULARIA *purpurea*. Branches quadrilateral and dichotomous; cells nearly oval, tubular, and imbricated, in nearly four rows; ovaria upright and campanulated.

Sea of Kamtschatka.

OBSOLETE.

26. SERTULARIA *obsoleta*. Cells oval, nearly heart-shaped, placed five and five in eight rows; branches alternate.

Frozen sea.

WILD PINE.

27. SERTULARIA *pinaster*. Cells in six rows; ovaria much swelled; branches alternate and pinnated.

Frozen Ocean.

DODDER.

28. SERTULARIA *cuscuta*. Cells in groups round

a cylindrical stem; groups distant from two to five millimetres: branches diverging, coming from the stem only where there are groups of cells.

European sea.

IDIA.

PINNATED, plant-like Polypidom; branches alternate, and compressed; cells alternate, distant, projecting, sharp at the summit, and curved.

1. IDIA *pristis*. This singular Polypidom was brought by Peron and Lesueur from the coasts of New Holland; and the genus it forms is easily distinguished by the perfect resemblance of its branches to the upper jaw-bone of the shark, armed with all its teeth. It differs from the Sertularias by its ramification, as well as by the form of its cells; but its general characters give it a decided place in our second Order.

The colour a yellow fawn, rather bright.

Its height does not exceed a decimetre.

Its fibrous root indicates its adherence to hard bodies rather than marine plants.—Plate 5. fig. 5. a. B. C. D. E.

Australasia.

CLYTIA.

Plant-like, branching, filiform, twining or climbing; cells campanulated, and standing on long pedicles, generally curved.

The Clytias form a very distinct group in our second Order. The polypi, fixed in their campanulated cells, can seek their food at a little distance from their colony, by means of a long pedicle which supports their little habitation: this elastic pedicle enables them to move in a circle of which the radius extends from four to five millimetres, and at the same time gives a rotatory motion to the water, which serves to draw within its vortex the animalcula on which it feeds.

The substance of the Clytias is cartilaginous; their colour, a yellow fawn, seldom varying; they are very small, sometimes hardly perceptible to the naked eye, and always parasites on the Thalassiophytes of the various seas on the face of the globe.

VERTICILLATED.

1. Clytia *verticillata.* Cells campanulated, toothed, upright, and supported on long peduncles, rather twisted, four to each verticil.

Seas of Europe.

CONVOLVULUS.

2. Clytia *volubilis.* Cells campanulated, toothed, and dispersed; peduncles very long, and very much twisted.

In the Atlantic, and on the Thalassiophytes of the European seas.

SYRINGA.

3. CLYTIA *syringa.* Cells inclining to a cone, longer than their peduncle, and dispersed.

Seas of Europe.

URN-SHAPED.

4. CLYTIA *urnigera.* Stem flexuous, stoloniferous, and rampant; cells on long peduncles, globular, and truncated; ovaria nearly oval, with a small truncated opening.—Plate 5. fig. 6. a. B. C.

On the fucus of Australasia.

GRAPE.

5. CLYTIA *uva.* Branching and rampant; cells nearly sessile, oval, and pointed.

European seas.

WRINKLED.

6. CLYTIA *rugosa.* Ovaria oval, marked with irregular transverse bands; the opening small, with one, two, or three teeth.

European seas.

LAOMEDEA.

PLANT-LIKE, and branching; cells stipited or substipited, and dispersed on the stems and branches.

The Laomedeas are easily known by the short peduncle that supports their cells, by the form and situation of those cells, as well as by the inarticulated and slightly branched stem; in some species but little flexible, and sometimes thinly incrusted at the lower part with a calcareous substance; and this part is almost always found devoid of polypiferous cells.

The form of these Polypidoms varies more than those of other genera; but the same generic character is observable, that of having their cells supported on a short pillar.

Their substance is horny, membranous, sometimes slightly cretaceous.

The colour varies according to the species; there are some of a deep brown fawn, and others of a bright clear yellow fawn.

Their height is also various, exhibiting every intermediate gradation from two centimetres to two or three decimetres.

These Polypidoms are found in all seas, sometimes parasites on the Thalassiophytes, and at others adhering to rocks by more or less numerous fibres of greater or less extent.

ANTIPATHES.

1. **Laomedea** *antipathes.* Stem rugged, branching, and bushy; branches pinnated; cells campanulated, and dispersed on the branches and shoots; pedicle rising from a flat base; colour red-brown, sometimes greyish; height a decimetre.—Plate 6. fig. 1. a. B.

Australasia.

LESAUVAGE'S.

2. **Laomedea** *Sauvagii.* Stem but slightly branching, and fistular; from a millimetre to a millimetre and half in diameter; cells campanulated, and very

distant from each other; colour yellow fawn; height about two decimetres.

Indian ocean.

SIMPLE.

3. **Laomedea** *simplex.* Stem simple; cells long, campanulated, and dispersed; colour a deep brown; height two decimetres.

On the fucus of Australasia.

M. LAIR'S.

4. **Laomedea** *Lairii.* Base or root branched; stem simple, or very slightly branching; cells dispersed, diverging, and supported on long peduncles; colour red-brown; height a centimetre.

Australasian seas.

DICHOTOMOUS.

5. **Laomedea** *dichotoma.* Stem dichotomous, and geniculated; cells campanulated; ovaria axillary, and supported on curved peduncles.

European seas.

THORNY.

6. **Laomedea** *spinosa.* Cells very small, almost invisible; branches dichotomous, and terminated by two bristly appendages; base composed of interwoven tubes.

European seas.

JOINTED.

7. **Laomedea** *geniculata.* Stem geniculated and uneven; ovaria oval, truncated, and pedicelled; pedicle curved.

European seas.

GELATINOUS.

8. **Laomedea** *gelatinosa.* Cells campanulated; border elegantly crenated; branches, both principal and secondary, numerous and dispersed.

Coast of Belgium.

PRICKLY.

9. **Laoemeda** *muricata.* Stem articulated; cells peduncled, alternate and solitary on each articulation; ovaria peduncled, prickly, and placed on the tubes of the root.

Coast of Scotland.

THOA.

Plant-like and branching; stem formed of numerous interwoven tubes; cells few; ovaria irregularly oval; polypi projecting.

These Polypidoms have characters peculiar to them, but also many irregularities, principally among those which are come to their full growth; in this last state they resemble a root of a stiff and horny substance, brittle in the lower part, a little flexible in the upper, and garnished with a large quantity of straight, short, stiff fibres.

The substance of the Thoas is horny, membranous, and rather brittle.

Their colour is a fawn, more or less deep, sometimes dull, at others bright and shining.

They seldom rise beyond two decimetres, and adhere to rocks or other solid bodies by interwoven hollow fibres, which sometimes form a mass of an inch in diameter; they are never parasites on marine plants.

FISH-LIKE.

1. THOA *halecina*. Cells scarcely any; two articulations at their base; ovaria oval, irregular, and solitary.

European seas.

SAVIGNI'S.

2. THOA *Savignii.* Ovaria in clusters, rarely isolated.—Plate 6. fig. 2. a. B. C.

Mediterranean.

SALACIA.

PLANT-LIKE and articulated; cells long, cylindrical, and in united formation to the number of four; their openings verticillated on the same line; ovaria oval and truncated.

The stem is compressed, slightly flexuous, stiff and brittle, as is the whole Polypidom; it supports branches formed of long cylindrical cells, four together in united formation, having their openings on the same line, as if verticillated, and a little projecting: this opening frequently appears situated at the side of the tubes.

The branches are placed on the flat part of the stem; their divisions, always alternate, have in their length one or two articulations.

The ovaria, nearly sessile, frequently axillary, sometimes dispersed, resemble an antique vase; at certain times their opening is closed by a lid with a concentric zone.

Their substance is horny; their colour a dull and deep fawn; their height a decimetre.

Australasia.

FOUR-CELLED.

1. SALACIA *tetracyttara*. The only species known. —Plate 6. fig. 3. a. B. C.

CYMODOCEA.

PLANT-LIKE; cells cylindrical, varying in length, filiform, alternate or opposite; stem fistular, marked with rings below, plain above, and without interior division.

These Polypidoms bear a strong resemblance to the Tubularias; but the Polypi belonging to the last-mentioned order are always placed at the summits of their branches, whilst those of the Cymodoceas are as constantly found on the branches or their divisions. The stem of the Cymodoceas is a continued horny or cartilaginous tube, simple or branching, and which in a living state should be filled with an irritable animal matter, with which the numerous Polypi placed on the surface of the stem are connected: this circumstance retains it in the second order; it is in reality an intermediate between the two.

The Cymodoceas are either simple or slightly branching.

Their substance horny, rather transparent, and fragile.

Their size varies as well as their colour, which is sometimes a reddish fawn, at other times lighter and more bright.

They adhere to solid bodies by a fine fibrous and extended base, from which issue the stems, or rather, on which the stems spread and twist before they rise.

One species has been brought from the Antilles, and another from the English coast, which two constitute all of the genus as yet known: the species will probably prove more numerous, when more frequently collected and attentively observed.

SIMPLE.

1. CYMODOCEA *simplex*. Base branching; stem simple, and slightly undulated; cells alternate, long, and filiform; colour, a yellow fawn; height, ten or twelve centimetres.—Plate 7. fig. 2. a. A.

England and Ireland.

BRANCHING.

2. CYMODOCEA *ramosa*. Stem a little branching; cells opposite at each ring; colour, a brown fawn; height, three or four centimetres.—Plate 7. fig. 1. a. A.

Antilles.

CLASS I.—ORDER III.

Plant-like Polypidoms, tubular, simple or branched, never articulated; of a horny or membranous substance, but sometimes slightly covered with a calcareous layer neither cellular nor porous: Polypidoms situated at the extremity of the stems, of their branches and their divisions.

GENERA AND SPECIES.

TIBIANA.

PLANT-LIKE, and fistular; branches flexuous or in zig-zag, with polypean openings at the sides, alternate, and thinly scattered.

The Tibianas are formed of numerous tubes, agglutinated or fastened together without being anastomosed. Their height varies according to the species or individual; the tubes separate, spread out, and assume the form of branches, that are simple or very slightly ramified, generally flexuous or in zig-zag: the openings from whence come the Polypi are placed in a prolongation of the tube, and at the extremity of each bend produced by its flexuosity: sometimes these openings are wholly directed to the base of the Polypidom, usually they are vertical; the tubes of the stems, as well as those of the branches, are fistular, without articulation or division. The principal branches, as in the Tubularias, appear to have no communication with one another; so that each tube seems to inclose a family isolated from those of the other branches when the polypus is multifarious, and a single animal when the tubes have but one opening.

The substance of the Tibianas appears horny, rather brittle than flexible, and sometimes slightly cretaceous.

Their colour is a brown fawn, more or less deep, or whitish.

Their height varies from one to two decimetres.

I believe them to be indigenous to the East Indies or Australasia.

FASCICULATED.

1. TIBIANA *fasciculata*. Branches in zig-zag, the thickness of a sparrow's quill; polypean opening at the side, alternate, placed at the extremity of each angle, and sometimes directed to the base; colour brown fawn; height a decimetre.—Plate 7. fig. 3. a.

BRANCHING.

2. TIBIANA *ramosa*. Stem the thickness of a goose-quill; branching at the extremity, flexuous, with thick polypean tubercles scattered on it; opening at the top, or horizontal; height from two to three decimetres; colour whitish.

Australasia.

NAISA.

A FIXED Polypidom; stem slender, membranous, frequently ramified, terminated, as are also its branches, by a polypus, whose body can wholly enter within the stem, and whose mouth is surrounded by a row of tentacula, generally ciliated.

These Polypidoms are found in various situations; some place themselves beneath the large leaves of the Nymphæas which float on the surface of running waters; others prefer stones that shelter them from the light.

They seldom exceed three centimetres in height, but are generally much smaller.

It is usually in clear running streams that the Naïsas are to be found; the number of their species is small, probably because they are not much known, and the few that are known are confined to Europe; although there is no reason to suppose they do not exist in the equatorial regions, as these little beings, concealed beneath the leaves of aquatic plants, have been overlooked by the naturalists who have visited those distant countries.

CREEPING.

1. NAISA *repens.* Tubes nearly cylindrical, blackish, narrow at their base, larger at their summit, and spreading.

In the Rhone, and other fresh waters in the north of Europe.

TRAILING.

2. **Naisa** *reptans.* Tubes membranous, transparent, branching, and much larger at the base than at the summit.—Plate 6. fig. 4. A.

In fresh water.

LIGHT-SHUNNING.

3. **Naisa** *lucifuga.* Tentacula retreating within the tube, ciliated at their edges, from twenty-five to thirty-two in number; ramifications numerous and horizontal; interior beads round and flat, and opening parallel to the body on which they rest.—Plate 6. fig. 5. A.

CAMPANULATED.

4. **Naisa** *campanulata.* Stem filiform, and alternately branching; orifice of the tubes marked with rings.

In stagnant waters.

SULTANA.

5. **Naisa** *sultana.* In a funnel-shaped tuft, ciliated at the base; tentacula twenty in number, and pointed.

In the fresh waters in the vicinity of Gottingen.

TUBULARIA.

Polypidoms simple or branching; tubular, of a substance almost horny, and transparent; a solitary polypus at the extremity of each branch, with two rows of tentacula; the inner ones rising in a little plume, the outer spreading in the form of rays.

The Tubularia vary little in their form; they are simple or slightly branched: their substance is more or less thick according to the size of the Polypidom, always horny, membranous, and slightly transparent.

Their colour is a shade of yellow fawn, clear or deep, dull or reddish; their height varies much, but never exceeds three decimetres.

It is very rare that the Tubularia are parasites on marine plants: they usually attach themselves to rocks, shells, or other hard bodies; sometimes, adhering to the keel of a vessel, they are transported from the Asiatic seas to those of Europe without losing any of their characteristics; but the climate and temperature soon affect these delicate beings, and they languish and die, leaving nothing but their habitations to attest their existence in countries so distant from that which produced them.

ANNULAR.

1. TUBULARIA *annulata.* Tubes simple, of the thickness of a crow-quill, marked with projecting and approximate rings.—Plate 7. fig. 4.

Catalonia.

CORNUCOPIA.

2. TUBULARIA *cornucopiæ.* A simple tube, smallest below, tortuous, and rough on the surface.—Plate 7. fig. 5.

Mediterranean.

UNITED.

3. TUBULARIA *indivisa.* Tubes very simple,

sometimes tortuous, and firmly united together at their lower part.

European seas.

MOSSY.

4. **Tubularia** *muscoïdes.* Tubes nearly dichotomous, marked at certain distances with transverse rings; many tubes united together, and forming very thick tufts.

European seas.

TRICHOTOMOUS.

5. **Tubularia** *trichoïdes.* Tubes lightly branching, in thick tufts, marked with rings, and of an equal diameter throughout; height about a decimetre and half.

European seas.

BRANCHING.

6. **Tubularia** *ramosa.* Tubes branching; ramifications attenuated at their commencement, and varying in length, but marked with rings throughout, sometimes curved: height from five to seven centimetres.

European seas.

DWARF.

7. **Tubularia** *pygmæa.* Tubes isolated, marked with rings, somewhat flexuous, and slightly branching; branches very short; height about a centimetre.

On the Amphiroa Dilatata of Australasia.

T. larynx

T. gracilis

T. Dumortierii

GENERA

BELONGING TO THE FIRST ORDER OF THE SECOND CLASS.

Telesto. Polypidoms branching; fistular; cretaceo-membranous, opaque, longitudinally striated.

Liagora. Lichen-formed; slightly incrusted with a chalky substance.

Neomeris. Simple, cellular in the upper part; embossed in the middle, and scaly in the lower part.

Acetabularia. Umbelliferous; umbel flat and striated in rays.

Polyphysa. Stem simple, and crowned with eight to twelve pyriform and polypean bodies.

Nesea. Pencil-form: branches articulated, cylindrical, and dichotomous.

Galaxaura. Fistular, dichotomous, and articulated.

GENERA

BELONGING TO THE SECOND ORDER OF THE SECOND CLASS.

Jania. Resembling moss, hairy and dichotomous; numerous ovaria.

Corallina. Compressed and trichotomous.

Cymopolia. Cylindrical and dichotomous; necklace-formed.

Amphiroa. Branches dispersed, dichotomous, trichotomous, or verticillated; articulations separated.

Halimeda. With flat or compressed articulations, generally fan-shaped.

GENERA

BELONGING TO THE THIRD ORDER OF THE SECOND CLASS.

Udotea. Fan-shaped, marked with curved and transverse lines.

Melobesia. Chalky incrustation; cells very small and dispersed.

CLASS II.—ORDER I.

GENERA AND SPECIES.

POLYPIDOMS plant-like, generally articulated, and formed of two substances: the one internal, or axe, which is membranous or fibrous, fistular or compact; the other external, or rind, of various thickness, which is calcareous, and incloses the polypiferous cells, rarely visible to the naked eye: some genera appear to have their polypi at the extremity of the branches or their divisions, or else they are found on the sides.

TELESTO.

PLANT-LIKE, branching, fistular, cretaceo-membranous, opaque, and longitudinally striated.

These Polypidoms are generally found in thick tufts, attached to marine plants as well as rocks.

Their colour varies from violet to fawn, orange, and golden yellow, and presents the most beautiful tints, which fade by desiccation.

They rarely exceed a decimetre in height, and are generally much smaller.

They are found in the Australasian seas, and the tropical regions of the Atlantic.

YELLOW.

1. **Telesto** *lutea*. Branches loose and straggling, not much striated; colour, a brilliant gold.

Australasia.

ORANGE.

2. **Telesto** *aurantiaca*. Slightly branching; orange colour, with a tinge of violet at the base of some of the branches; height from two to four centimetres. —Plate 7. fig. 6.

Australasia.

MARINE.

3. **Telesto** *pelagica*. Stems very branching, cylindrical, and slightly striated; colour green.

Atlantic Ocean.

LIAGORA.

Polypidoms branching and plant-like, fistular, having the appearance of lichen, with a thin cretaceous incrustation.

There are no Polypidoms in existence which bear so strong a resemblance to certain lichens, as the Liagoras, whether in their form, their appearance, or their colour; indeed the similarity is so striking that previous to the result of recent observations which have fixed their rank among animal existence, our most learned botanists classed them with the Fuci.

The Liagoras differ from the Sertularias, in the total absence of any cells; from the Corallinas, in their want of articulations; and from the genus Tubularia, in the flaccidity and opacity of the sides of their almost fistular branches; but they belong to our present order from the situation of the Polypi, which are placed at the summit of their branches and divisions.

Their substance is membranous, sometimes slightly covered with a cretaceous coating, which is either united in a crust, or friable. The surface has frequently the appearance of being wrinkled, from the drying of the Polypi contained in the interior of the branch. In the living state, this surface is even, and surrounded by a gelatinous matter, doubtless of an animal nature, which becomes earthy by desiccation.

The Liagoras in their colour present the most delicate of tints, blending most pleasingly together: some of them are white; some inclining to red, others yellow, or green, and sometimes violet; one individual has sometimes been found to possess all these hues; but they are very fugitive.

The Liagoras are not rare in the equatorial or temperate regions, particularly in the Mediterranean;

probably they would not be found in the latitudes bordering on the frozen seas of either pole.

VARIEGATED.

1. **Liagora** *versicolor.* Stem branching or dichotomous; extremities simple or bifurcated: colours varying from white to yellow, to red, and to green.

Var. A. Branches dispersed.

Var. B. Branches compressed, very flexible, and frequently dichotomous.

Var. C. Branches constantly dichotomous; rather stiff, and nearly cylindrical in the state of desiccation.

Variety A. European seas; B. coasts of France; C. Mediterranean.

CERANOIDOUS.

2. **Liagora** *ceranoïdes.* Stem dichotomous; dichotoma numerous and near to each other; branches the thickness of a boar's bristle, forked in its termination; colour whitish; height from four to five centimetres.

On the coast of the Island of St. Thomas.

VESICULAR.

3. **Liagora** *physcioïdes.* Stem branching and even; branches dispersed, few in number, and of a brown colour.

Mediterranean.

ORANGE.

4. **Liagora** *aurantiaca.* Stem branching, and gar-

nished, as well as the branches, with small, scattered, and rather numerous filaments ; colour orange.

Mediterranean.

FARINACEOUS.

5. **Liagora** *farinosa.* Stem very branching, appearing as if thorny; branches dispersed; smaller branches long and filiform, sometimes dichotomous, and covered with a whitish powder which gives this Polypidom a farinaceous aspect; colour, a deep olive green ; height, from one to two decimetres.

Red sea.

WHITE.

6. **Liagora** *albicans.* Stem branching; branches dispersed; colour, a uniform greyish white; height fifteen centimetres. Plate 7. fig. 7.

East Indies.

EXPANDED.

7. **Liagora** *distenta.* Stem cylindrical, filiform, and very branching; principal and smaller branches spread out, and forked at the summit.

Bay of Cadiz.

NEOMERIS.

Simple Polypidom, incrusted ; incrustation cellular in the upper part, embossed in the middle, and scaly in the lower part.

The Neomeris do not branch; their form resembles a spindle, and they are about two or three decimetres long.

Their colour is whitish.

They are found in thick tufts mixed with the stems of the Acetabularia Crenulata, and other Polypidoms.

BUSHY.

1. NEOMERIS *dumetosa.* This is the only species belonging to the genus; it is found in the Antilles. —Plate 7. fig. 8. a. B.

ACETABULARIA.

UMBEL-SHAPED Polypidom; stem branchless, slender, fistular, and terminated by a striated and radiated umbel, either flat or inclining to a funnel-shape.

The Acetabularias partake of the characters of the Tubularias, as well as Sertularias, by the situation of their Polypi, each placed in a distinct tube, and participating a common existence by means of the stem to which the lower part of each animalcule is attached; these tubes, which are very visible and projecting in the lower part of the umbel, blend and disappear when they reach the stem; they form distinct lines, on the upper part of the disk.

They are found in thick tufts on rocks and solid bodies; in the first stage of their development, the tube attains its full size, and the umbel is about one line in diameter; by little and little this umbel enlarges, and soon acquires its full size; when it has reached this point, it only increases in thickness, and soon after perishes; for many circumstances induce the belief that these Polypidoms have not a long existence. In the sea the stems are flexible, gelatinous, and of a greenish colour; the disks sometimes display a very brilliant shade of green. By desiccation some of these characteristics disappear, the polypidom becoming very fragile, and nearly white.

The Acetabularia seldom reach a decimetre in height; they are found in the tropical and temperate seas of both hemispheres.

MEDITERRANEAN.

1. **Acetabularia** *Mediterranea.* Umbel with an even border.

Mediterranean.

CRENATED.

2. **Acetabularia** *crenulata.* Umbel with a crenated border.—Plate 8. fig. 1.

Seas of Antilles.

POLYPHYSA.

A SIMPLE stem, fistular, filiform, and surmounted with from eight to twelve polypous pyriform bodies, all proceeding from one point.

This Polypidom has a filiform and hollow stem; simple, fragile, and cretaceous; surmounted by a cluster of pyriform fistular bodies, which are filled with small white spherical grains, imagined to be the remains of the dried animal: by desiccation these pyriform bodies are compressed; they become concave on one side, and convex on the other, resembling a small oval spoon.

The substance of the Polyphysas is membrano-cretaceous; they are brittle in a dry state, and become flexible in water.

Those individuals which have come under my observation had a whitish appearance, but it is said that in a living state they are of a brilliant green; this, however, disappears on exposure to air and light.

Their height never exceeds four centimetres, and the pyriform bodies growing at the extremities are each about two millemetres in length.

1. POLYPHYSA *aspergillosa.* This is the only species hitherto observed; it was found in King George's Sound, on the western coast of North America, sometimes known by the name of Vancouver's Island. —Plate 8. fig. 2. a. B. C. D.

NESEA.

POLYPIDOM in the form of a hair-pencil; stem simple, terminated by articulated branches, which are cylindrical, dichotomous, and united in a head.

The Neseas have been classed among the Corallines by all preceding naturalists; they however differ from the latter in too many circumstances to permit our confounding one with the other. Their stems are not fistular, like those of the Polyphysa and the Acetabularia; nor so compact as those of the Corallines; they are composed of numerous fibres loosely anastomosised, rather longitudinal than transversal, and contained in a membranous tube, which is encased in a calcareous crust, varying in thickness. These stems are always simple, sometimes isolated, and at other times consisting of several united together, and adhering so firmly that it is difficult to separate without injuring them. This adhesion is probably caused by the gelatinous matter which wholly covers these Polypidoms in a living state, and which in drying glues together the parts where it most abounds.

The branches which diverge from the extremity of the stem are always dichotomous, articulated, cylindrical, polypous at the extremities, and bear a strong resemblance to the genus Galaxaura.

Having had no opportunity of seeing the Neseas in the plenitude of existence, when they are first taken from the sea, I can only presume, from attentively observing their organisation, that in a living state the stem is animated like the mass of the Alcyoneas, and susceptible of some obscure movements; and also that these Polypidoms are wholly enveloped in a mucilaginous substance, which is of a green colour.

These Polypidoms are of a membrano-calcareous substance, of a bright green in a living state, becoming white by desiccation, and rarely exceed a decimetre in height; they are found in the Antilles, and on the shores of the islands at the entrance of the Gulf of Mexico; they adhere to rocks and solid sands by numerous and rather long fibres.

PHŒNIX.

1. NESEA *phœnix*. Stem rising from a fibrous root, simple till it reaches the brushy head, whose branches are composed of several rows of articulations united and convergent, forming an oblong tuft.

Coasts of the islands of Bahama.

ANNULAR.

2. NESEA *annulata*. Stem simple and in rings, or strongly marked with transverse wrinkles.

The Antilles.

WOOLLY.

3. NESEA *eriophora*. Stem cylindrical or slightly compressed, short, smooth on the surface; branches as fine as the hair of wool; the full size about four centimetres.

The Antilles.

PENCIL-SHAPED.

4. NESEA *penicillus*. Stem cylindrical, and nearly

equal throughout its length; branches numerous, filiform, and united in a head.

Caribean sea.

PYRAMIDAL.

5. NESEA *pyramidalis.* Stem very large at the base, and gradually diminishing as it rises, crowned by some branches of nearly a millemetre in diameter, but not so numerous as in the preceding species.

The Antilles.

TUFTED.

6. NESEA *dumetosa.* Branches short, cylindrical, and irregular; growing so close as to touch each other, and forming a mass by the desiccation of the gelatinous substance which surrounds them in a living state; each branch is more than a millemetre in diameter, and three or four centimetres in length.—Plate 8. fig. 3. a. B.

The Antilles.

GALAXAURA.

PLANT-LIKE, dichotomous, articulated, fistular, and cylindrical; cells, if there are any, are invisible.

Preceding authors have differed in the classification of these Polypidoms, which in their characters approach some species of Tubularias, as much as they do the Corallinas ; like the first, their stem and branches are fistular and of a cylindrical form, frequently marked with parallel and circular rings ; like the second, they are articulated, regularly ramified, and of a membrano-fibrous substance, incrusted with a calcareous matter which effervesces in acids. But again these Polypidoms have not that rigidity which seems peculiar to the Corallinas; they approach nearer the Liagoras in their flaccidity, their substance, and the position of their polypi. These animalcula are placed at the extremities of the ramifications, which frequently appear closed by the drying of the body of the animal, which is formed of a non-cretaceous substance, more horny and more gelatinous than the other parts of the Polypidom : sometimes the substance is the same throughout the whole surface ; at others, the ramifications are open at their extremities. With such variety of character, we cannot wonder at the difficulty of determining their order.

The form, however, of the Galaxauras does not greatly vary ; they are most of them dichotomous and regular in their divisions. Some of them are strongly articulated, and in others the articulations are scarcely discernible ; these last have in general their rings more strongly marked than the first; it appears as if nature had provided them with these rings to supply the deficiency of articulations.

The colours of the species that are preserved in collections show a diversity of hues, from the violet to green, yellow, or white, sometimes most pleasingly blended; probably in the midst of the sea, and whilst their polypi are living, the Galaxauras, as well as the Neseas and Acetabularias, are of a more or less bright grass-green, slightly tinged with violet.

The height of these Polypidoms is not considerable, rarely exceeding a decimetre; and there are some which scarcely reach three centimetres.

It is with these that I shall conclude the description of the species belonging to this genus, which seems naturally to unite itself with the one which follows, viz. the Janias, an intermediate link between the Galaxauras and the Corallinas.

OBLONG.

1. GALAXAURA *oblongata.* Articulations long, and rendered flat by desiccation: rind or exterior very thin, and inclining to red.

Seas of America and coast of Portugal.

UMBELLATED.

2. GALAXAURA *umbellata.* Branches dichotomising at every articulation, and each rising to the same height, which gives the Polypidom the form of an umbel; the diameter of the stems and their branches about three millemetres; colour inclining to white; height from six to eight centimetres.

Caribean sea.

OBTUSE.

3. GALAXAURA *obtusata.* Articulations oblong and oval, rounded at both extremities.

Coasts of the Bahamas.

ANNULAR.

4. **Galaxaura** *annulata.* Stem and branches marked with approximate rings; extremities flattening by desiccation; colour yellowish green or inclining to red; height five or six centimetres.

Oriental seas.

WRINKLED.

5. **Galaxaura** *rugosa.* Articulations marked with rings, and slightly wrinkled, cylindrical, and flattened at both extremities; branches sometimes diverging.

American seas.

MARGINATED.

6. **Galaxaura** *marginata.* Branches flattening by desiccation, and turning up at their edges.

Coasts of the Bahamas.

STONY.

7. **Galaxaura** *lapidescens.* Articulations slightly marked, cylindrical, and hairy.

Cape of Good Hope.

SHRUBBY.

8. **Galaxaura** *fruticulosa.* Branches cylindrical, contiguous, inclining to yellow, and pointed at the summits.

Coasts of the Bahamas.

HARD.

9. **Galaxaura** *indurata.* Branches nearly contiguous, cylindrical, even, and diverging.

Coasts of the Bahamas.

RIGID.

10. **Galaxaura** *rigida*. Articulations invisible; branches stiff and brittle, marked with transverse rings; rings covered with a row of straight short hairs; colour reddish green; height one or two centimetres.—Plate 8. fig. 4. a. B.

On the Thalassiophytes of the Indian seas.

LICHEN-FORMED.

11. **Galaxaura** *lichenoïdes*. Branches continuous, a little wrinkled, and flattened at the extremities.

Coasts of the Bahamas.

JANIAN.

12. **Galaxaura** *Janioïdes*. Stems in tufts; branches dichotomous, filiform, slightly articulated, with a strong resemblance to those of the genus Jania; height about two centimetres; colour whitish, tinged with a grey violet.

Australasia.

CLASS II.—ORDER II.

GENERA AND SPECIES.

JANIA.

Mossy or hair-like, dichotomous, and articulated; articulations cylindrical, axe or interior horny; rind less cretaceous than that of the Corallinas.

Former zoologists have united the Janias to the genus of Corallinas; but these two groups of Polypidoms have characters sufficiently distinct to admit their separation. The Corallinas are constantly trichotomous, whilst the Janias are as regularly dichotomous; the former have their articulations more or less compressed, frequently triangular, and only cylindrical in some parts of the Polypidom; whilst the articulations of the latter are cylindrical from the base to the extremities. The position of the polypi may perhaps be different: however, every thing favours the presumption that, they are placed as in the preceding genera, at the extremities of the branches. The Corallinas, far from indicating this character, appear on the contrary covered on the surface with polypiferous filaments, which, though scarcely retractile, are yet endowed with a movement that can only be attributed to life.

The Janias resemble the Corallinas in their substance, and particularly in those oval bodies which are looked upon as ovaria, and thus form a perfect analogy between the two groups; this analogy is most discernible in the *Jania corniculata,* which sometimes exhibits all the characters of a true Coralline in its lower part, whilst the upper is wholly devoid of them.

Thus then, as previously observed, may these Polypidoms be considered as intermediates between the Corallinas and the Galaxauras, without decidedly belonging to either the one or the other.

In the bosom of the sea, the Janias are of a greenish violet; this colour changes to a rose, or bright red, which becomes pure white by the action of air and light.

Their height never exceeds four centimetres, but some of them are not more than three millemetres high.

They are found in all latitudes, and in all depths; in general parasites on the marine plants, which they sometimes wholly cover with a thick coating.

GIBBOUS.

1. **Jania** *gibbosa.* Articulations swelled in the central part: height from one to three millemetres.

On the Fucus latifolius of the Red Sea.

DWARF.

2. **JANIA** *pygmæa.* Branches diverging; articulations unequal, flexuous, and wrinkled; colour reddish violet; height from two to three millemetres. —Plate 9. fig. 1.

On the Galaxaura lapidescens of the Cape of Good Hope.

DIMINUTIVE.

3. **JANIA** *pumila.* Branches awl-shaped; articulations of the extremities two or three times as long as those near the base; whitish colour; height from five to six millemetres.—Plate 9. fig. 2.

Within the hollow of the leaf of the Fucus turbinatus found in the Red Sea and Indian Ocean.

ADHERENT.

4. **JANIA** *adherens.* Branches diverging, intertwined, and brittle, of the thickness of hair, and adhering to paper on desiccation; colour greenish.

Mediterranean.

PEDUNCULATED.

5. **JANIA** *pedunculata.* Articulations short; extremities of the branches truncated; ovaria pyriform, and always on foot-stalks, never with an appendage; colour light rose; height from one to two centimetres.—Plate 9. fig. 3. a. B.

Australasia.

WARTY.

6. **JANIA** *verrucosa.* Branches few and stiff; arti-

culations long, and covered with warty pustules; colour greenish; height from four to five centimetres. —Plate 9. fig. 4. a. B.

South America.

Nota. Many species appear warty as well as this; their asperities are probably owing to some extraneous calcareous deposition, perhaps to some more stony Polypidom. Far from making a part of the Polypidom, these asperities are easily detached on being slightly rubbed, leaving bare the cretaceous envelopes of the Jania.

SMALL-JOINTED.

7. JANIA *micrarthrodia.* Articulations very short, and contiguous each to other; colour greenish red; height from two to three centimetres.—Plate 9. fig. 5. a. B.

On the fucus of Australasia.

Nota. This species is only distinguished from the one that follows by the articulations, of which the length does not exceed their diameter in the first, but is from four to six times longer in the second.

RED.

8. JANIA *rubens.* The articulations of the dichotoma are in the form of clubs, the other articulations cylindrical; ovaria of many forms, solitary or connected as if strung, those at the extremities always accompanied with one or two appendages.

European seas.

Variety A. Branches long; no ovaria.—Plate 9. fig. 6.

European seas.

Var. B. Inclining to pyriform; solitary ovaria on each branch.—Plate 9. fig. 7.

South America.

Var. C. Crested, or like a plume; with truncated ovaria.

European seas.

Var. D. Seeded; ovaria numerous, with long setaceous appendages.

European seas.

Var. E. In links.

European seas.

Var. F. Surface of the articulations sometimes covered with small projecting asperities.

Mediterranean.

Var. G. In no wise differs from Var. A. except in being considerably smaller.

America.

HORNED.

9. JANIA *corniculata.* Articulations of the stems and branches slightly compressed in the upper part, the sides terminating in setaceous appendages, varying in length.

Var. A. Appendages short.

Var. B. Polypidom very small, appendages long.

Var. C. Polypidom of moderate size; appendages long and curly.

Var. A. European seas ; B. Thalassiophytes of the coast of Cherbourg ; C. Bay of Cadiz.

CORALLINA.

Plant-formed Polypidom, articulated, branched, and trichotomous ; axe or interior wholly composed of horny fibres ; rind cretaceous and cellular ; cells invisible to the naked eye.

The ancient authors had united under the name of Corallinas all the flexible Polypidoms, such as the Sertularias, Tubularias, &c. Later writers on the subject deemed it advisable to reserve this denomination for one order in this class of creation : but observing the various characters which accompanied this order, I have been induced to divide it into genera, and assign particularly to one genus the appellation of Corallina.

The Corallinas of Europe have their polypean cells so very small, and so subject to obliteration, that it is not extraordinary they still remain undiscovered: in the equatorial seas the cells are much larger, and frequently visible to the naked eye.

In rambling over the Calvados, (a range of rocks on the coast of Normandy,) I have frequently found a very large Corallina, a variety of the C. Officinalis ; it was covered with simple transparent filaments, a millemetre in length, which had a movement peculiar to themselves: they disappeared with the slightest agitation of the water, or when the Polypidom was exposed to the air; in the latter case I was never able with the strongest magnifier to discover the slightest remains of these filaments, the point they had been attached to, or the cells they might have issued from, supposing them to have been polypi. This however remains doubtful, as it was only in spring I ever observed them, and then only on a few particular individuals: I never could discover them in winter.

We frequently observe in the Janias and Corallinas small globular bodies, more or less voluminous, and varying in their substance; the tubercles that are found on the Amphiroas, the Halimedas, the Udoteas, and the Melobesias, appear analogous. Ellis imagined them air-vessels to support them in the water; but these vesicles are rarely empty. I have frequently found them solid, or filled with small grains of an unknown nature. They are more probably ovaria, enclosing the germs of future Polypidoms. All the flexible Polypidoms appear thus to multiply.

The Polypidoms for which I have reserved the generic name of Corallina, have always articulated stems, more or less compressed, more or less branched, and constantly trichotomous. Their colours when fresh generally incline to red or purple; exposed a very short time to the action of air, light and humidity, they display a variety of hues, each more brilliant than the other, from the lightest or the brightest rose to a dull brown, or greenish, or only with a tinge of red. Infinite gradations are observed: but they all bleach by the action of the atmospheric fluids.

The Polypidoms of this genus are found in all latitudes, in all depths, and on all the coasts of the five divisions of the world. They are however observed to be larger in the equatorial seas, more brilliant in their hues, and more elegant in their form. Fixed usually on rocks, or other hard and almost immovable bodies, they resist the influence of the waves, and are very rarely cast upon the shores. Only one or two species of Corallinas are parasites on the Thalassiophytes, whilst nearly the whole of the Janias are found upon these vegetables.

The Corallinas vary but little in their height; they sometimes exceed a decimetre, but are in general less: I however never met with any under two centimetres.

The Corallina Officinalis was formerly used as an anthelminthic, or destroyer of worms, and absorbent; but in the beginning of the eighteenth century it seemed nearly to have fallen into disuse: at a later period it was again brought into vogue from the reputation of the Fucus Helminthochorton, vulgarly called Moss of Corsica, whose properties seem to be of the same nature.

A very good analysis of the Corallina Officinalis, such as it is found in the shops and in collections, has been given by M. Bouvier of Marseilles: he found the component parts of a thousand grains to be—

	Grains.
Marine salt	10
Gelatine	66
Albumen	64
Sulphate of lime	19
Silex	7
Iron	2
Phosphate of lime	3
Magnesia	23
Lime	420
Carbonic acid combined with lime	196
Carbonic acid combined with magnesia	51
Water	141
	1002

This analysis does not essentially differ from that of the Moss of Corsica.

OFFICINAL.

1. **Corallina** *officinalis*. Almost bipennated; articulations nearly cuneiform.

European seas.

MAILED.

2. **Corallina** *loricata*. Articulations compressed, convex, cuneiform, angular at the sides, and nearly lobed above; lobes small and obtuse.

Mediterranean.

KNOTTED.

3. **Corallina** *nodularia*. Very branching; arti-

culations thick and cuneiform, those of the bifurcations being the largest, the terminals three-pointed or oval.

Mediterranean.

Nota. It is not improbable that the Nodularia and the Loricata may be mere varieties of the Officinalis.

ELONGATED.

4. Corallina *elongata.* Articulations of the base cuneiform, those of the branches cylindrical, and the terminating ones obtuse.

Coasts of Calvados and English Channel.

POLYCHOTOMOUS.

5. Corallina *polychotoma.* Articulations nearly triangular, sometimes undulated or else concave, flat at the extremities, cylindrical in the stem, compressed in the intermediate parts, frequently producing more than three branches, which issue from the sides. Height three or four centimetres.

Found among the Thalassiophytes of the Bay of Cadiz, and, from the various forms of its articulations, is one of the most singular of the genus.

LOBED.

6. Corallina *lobata.* Articulations of the stems and their branches cylindrical at the base, five or six times larger, and compressed, or nearly flat, at the extremity, which is horizontally truncated, and marked with three or four lobes of no regular depth; the articulations of the summits are of a leafy form; colour

greenish violet; height from two to three centimetres.

On the Fucus corneus of the Canaries.

CYPRESS.

7. Corallina *cupressina*. Very branching; branches bipennated, and very close, nearly imbricated.

Coast of Calvados.

CUVIER'S.

8. Corallina *Cuvieri*. Very branching; branches bipennated; divisions flat, proceeding from each articulation, and, as it were, imbricated; articulations nearly globular in the stems, compressed in the branches and their divisions, and cylindrical in the pinules; ovaria oval or globular, and placed at the summit of the pinules; colour reddish violet; height a decimetre.—Plate 9. fig. 8. a. B.

Australasia.

SCALY.

9. Corallina *squamata*. Articulations of the base rounded, compressed, and cuneiform; those of the branches flattened, the upper ones sharp-edged.

European seas.

GRANIFEROUS.

10. Corallina *granifera*. Articulations of the stems compressed and cuneiform; those of the branches nearly cylindrical; ovaria oval, pedunculated, opposite, and frequently proliferous.

Mediterranean.

AWL-SHAPED.

11. **Corallina** *subulata.* Articulations of the stem sharp and cuneiform, proliferous at their upper angles; branches short and awl-shaped, with cylindrical articulations.

Seas of America.

SLENDER.

12. **Corallina** *gracilis.* Branches numerous and slender, elegantly bending; articulations approximate, cylindrical below, and compressed at the upper part; colour an agreeable mixture of violet and white; height about a decimetre.—Plate 10. fig. 1. a. B.

Australasia.

TURNER'S.

13. **Corallina** *Turneri.* Much and elegantly branched, tripennated; articulations of the principal branches cuneiform, and compressed on the sides; those of the smaller ramifications and their divisions perfectly cylindrical; the colour, a greenish yellow, with red and violet agreeably blended; height from five to eight centimetres. Plate 10. fig. 2. a. B.

Australasia.

CURLED.

14. **Corallina** *crispata.* Very branching, covered with articulated filaments, curved, short, and appearing dispersed, although situated on the sides; articulations very close, those of the filaments long and cylindrical; ovaria pedicelled, oval, and sharp-pointed; rose-colour; height from five to eight centimetres.—Plate 10. fig. 3.

Australasia.

HAIRY.

15. **Corallina** *pilifera*. Articulations of the stem and principal branches nearly globular, covered with dispersed and hairy filaments, branching from their origin, articulated, cylindrical, and sometimes half a centimetre long; ovaria pyriform, sometimes with filaments like the articulations of the stems; colour white, with a slight shade of green or violet; height from four to five centimetres.

Australasia.

SIMPLE.

16. **Corallina** *simplex*. Very slightly branching; articulations cylindrical at the base, compressing almost immediately, unequal in size, and of various forms; straw-colour; from four to five centimetres in height.—Plate 10. fig. 4.

American seas.

CALVADOS.

17. **Corallina** *Calvadosii*. Articulations irregularly compressed, sometimes zoned like the Ulva pavonia; those of the stem and the lower branches more broad than long, nearly triangular, and marked with two or three furrows; those at the extremities nearly cylindrical; height three or four centimetres.

Particularly observed on the rocks of Calvados.

PALMATED.

18. **Corallina** *palmata*. Articulations compressed, convex and cuneiform; the upper ones large and lobed.

American seas.

PROLIFEROUS.

19. **CORALLINA** *prolifera.* Small ramifications implanted on the surface of the articulations; the articulations resembling the cells of bees, compressed, and near two millemetres in breadth; colour very white by desiccation; height one decimetre.—Plate 10. fig. 5.

Oriental India.

PINNATED.

20. **CORALLINA** *pinnata.* Branches pinnated, approximate; colour inclining to yellow.

Coasts of the Bahamas.

CYMOPOLIA.

POLYPIDOMS plant-like, necklace-formed, and dichotomous; articulations cylindrical and separated from each other; polypean pores almost visible to the naked eye.

Two species alone have served me to establish this genus, which differs from that of the Corallinas by the dichotomous ramifications, from that of the Galaxaura by the thickness of the cretaceous rind, and the smallness of the interior tubular axe; it also differs from the Amphiroas by the regularity of its divisions: which peculiarities distinctly separate them from any of these genera. They are easily recognized by the form of the articulations and by the division of the branches.

Their organisation and colour resemble those of the Corallinas.

Their height does not appear to exceed a decimetre.

They are said to originate from the Antilles, and chiefly from Jamaica.

BEARDED.

1. **Cymopolia** *barbata.* Dichotomous; articulations cylindrical; branches with hairs at their extremities.

Coast of Jamaica.

NECKLACE-FORMED.

2. **Cymopolia** *rosarium.* Articulations nearly globular, the lower cylindrical; separated from each other by a very small interval.

Caribean sea.

AMPHIROA.

Plant-like and articulated; branches dispersed, dichotomous, trichotomous, or verticillated; articulations long, and separated from each other by a bare and horny substance.

The Amphiroas resemble the Corallinas in the substance both interior and exterior of the articulations; their colours exhibit the same hues; their height is nearly equal. The substance of the part connecting the articulations in these Polypidoms possesses a rigidity and fragility, somewhat resembling the Isis when divested of its polypiferous rind.

The Amphiroas multiply by tubercular ovaria, placed on the cretaceous part of the articulations; these ovaria are sometimes abundant, and sometimes scanty; they appear organised like the pyriform ovaria of the Corallinas and Janias.

The Amphiroas differ in their forms more than the Corallinas ; in the latter the articulations are nearly alike: but in the former they are sometimes found cylindrical in the stem, compressed in the branches, and either flat or spoon-shaped at the extremities. They vary equally in their ramifications; dispersed in some, dichotomous in a few, and in others verticillated once or many times, the verticils in many species consisting of numerous branches; sometimes all these characters are found united in the same individual.

Their colours are similar to those of the Corallinas.

They do not exceed a decimetre in height, nor are they ever less than three or four centimetres.

They are usually found in warm and temperate latitudes. I am inclined to think they are not inhabitants of the colder regions. They are attached to rocks and other hard substances, never parasites on marine plants.

The Corallina Officinalis, or Corsican moss, is sometimes chiefly composed of polypidoms of this genus.

RIGID.

1. AMPHIROA *rigida.* Branching; branches dispersed and few in number; articulations cylindrical, nearly touching each other, and wrinkled; colour greyish white; height about three centimetres.—Plate 11. fig. 1.

Mediterranean.

SHINING.

2. AMPHIROA *lucida.* Branches dichotomous; articulations perfectly cylindrical and shining; colour white; height from four to six centimetres; diameter of the articulation one millemetre.

SPINDLE-SHAPED.

3. AMPHIROA *fusoïdes.* Dichotomous; articulations spindle-shaped, the lower ones warty; colour, a brilliant white; height from four to six centimetres; diameter of the stem and lower branches from one to two millemetres.—Plate 11. fig. 2.

Indian Ocean.

BRITTLE.

4. AMPHIROA *fragilissima.* Nearly dichotomous; branches hair-like; articulations cylindrical, with a swelling in the form of a ball or pad at their extremities.

Mediterranean, Indian and American seas.

DE GAILLON'S.

5. AMPHIROA *Gaillonii.* Dichotomous; articulations long and cylindrical, a little swelled at the extremities; those at the summits slightly compressed; surface sometimes warty; beautifully coloured with

rose, violet, and green; height from six to eight centimetres.—Plate **11.** fig. 3.

Australasia.

DILATED.

6. Amphiroa *dilatata.* Dichotomous, and very stiff; branches almost divergent; articulations very distant, frequently with a small round swelling at the extremities, cylindrical in the lower part, compressed in the middle, and becoming nearly flat at the summits; generally of unequal breadth; colour variegated with green, red, and violet; height from five to seven centimetres.

Australasia.

DE BEAUVOIS'S.

7. Amphiroa *Beauvoisii.* Dichotomous; stem cylindrical; branches compressed; extremities nearly flat; much smaller than the preceding in all its parts.

Coast of Portugal.

CUSPIDATED.

8. Amphiroa *cuspidata.* Generally tetrachotomous, but sometimes having only two or three divisions; articulations long, cylindrical, and pointed at the extremities.

American seas.

WARTY.

9. Amphiroa *verrucosa.* Trichotomous or subverticillated; articulations swelled at each extremity, cylindrical, and almost wholly covered with warty

points ; colour, a greenish rose ; height from three to four centimetres.—Plate 11. fig. 4.

Australasia.

INTERRUPTED.

10. **Amphiroa** *interrupta.* Branches verticillated; articulations of the principal branches separated by long and unequal intervals ; these intervals approximate in the secondary branches, and touch in the small ones ; colour, a reddish green ; height from three to four centimetres.—Plate 11. fig. 5.

Australasia.

MANED.

11. **Amphiroa** *jubata.* Branches verticillated ; articulations of the principal branches very thick ; those of the verticil very small, unequal, and hair-like ; colour inclining to red ; height from four to six centimetres.—Plate 11. fig. 6.

Australasia.

CHAROIDAL.

12. **Amphiroa** *charoïdes.* Branches verticillated, with verticils of small branches at each articulation ; articulations cylindrical, long, and unequal ; the surface warty or with tubercles ; colour, an earthy yellow ; height a decimetre.

Australasia.

BRIERY.

13. **Amphiroa** *tribulus.* Articulations cylindrical, compressed, or sharp-edged.

American seas.

HALIMEDA.

Polypidoms plant-like and articulated; articulations flat or compressed, very rarely cylindrical, generally fan-shaped; axe fibrous; rind cretaceous, and usually rather thin.

The Halimedas are unlike any genera of the present order; the interior and exterior substances can alone establish their place in it.

They are found in the seas of the warmer latitudes; they sometimes, though rarely, appear on the southern shores of the Mediterranean, increasing in number as you approach the equatorial seas. They are abundant in the Antilles.

The Corallinas surpass them in variety and brilliancy of hues; although green in the bosom of the sea, they become white on exposure to light and air.

They rarely exceed a decimetre in height, and are never below five centimetres.

The Halimedas are sometimes parasites on the Thalassiophytes, but more frequently adhere to rocks or solid sands by numerous fibres of unequal length.

They are found mixed with the Corallina of Corsica, and appear in no wise to alter the anthelminthic and absorbent qualities of that Polypidom.

NECKLACE-FORMED.

1. **Halimeda** *monile*. Lower articulations compressed, convex, cuneiform, and oblong; the upper ones nearly cylindrical.

American seas.

THICK.

2. **Halimeda** *incrassata.* Articulations convex, compressed, or flat, and of many shapes.

Caribean Sea.

MANY-STALKED.

3. **Halimeda** *multicaulis.* Lower articulations nearly cylindrical; upper ones kidney-shaped, flattened and lobed.

IRREGULAR.

4. **Halimeda** *irregularis.* Articulations of various shapes, from two to three millemetres in length or breadth; height of the Polypidom four or five centimetres.—Plate 11. fig. 7.

The Antilles.

THREE-TOOTHED.

5. **Halimeda** *tridens.* Articulations flattened, and in three lobes.

American seas.

OPUNTIA.

6. **Halimeda** *opuntia.* Articulations compressed, fan or kidney-shaped, undulated on the borders.

Mediterranean and Atlantic.

TUNA.

7. **Halimeda** *tuna.* Articulations plain, and nearly round.—Plate 11. fig. 8. a. b.

Mediterranean.

CLASS II.—ORDER III.

GENERA AND SPECIES.

INARTICULATE POLYPIDOMS.

UDOTEA.

A FAN-FORMED, non-articulated Polypidom; cretaceous, uninterrupted rind, marked with many curved and concentric lines, which are parallel and transversal.

The colour of the individuals, which I have had opportunities of observing, has inclined to white, like the Halimedas when dry. I am induced to think this colour would originally be green, as well as that of many Corallinas.

Their height varies from five to fifteen centimetres.

The Udoteas originate from the equatorial seas of America; from their rarity in collections, it is probable they are not very numerous.

FAN-SHAPED.

1. UDOTEA *flabellata*. Stem simple, with a fibrous root; expansions divided in fan-shaped branches, which are rarely proliferous. **Plate 12. fig. 1.**

Equatorial seas of America.

CONGLUTINATED.

2. UDOTEA *conglutinata*. Stem simple, with a fibrous root; expansion plain, and fan-shaped.

Coasts of the Bahamas.

MELOBESIA.

STONY Polypidom, found in thin patches of greater or less expansion on the surface of the Thalassiophytes; cells very small, and placed at the summit of small tubercles dispersed upon the patches.

The Melobesias form patches of various sizes, sometimes round and regular, and at others irregular; some wholly cover the marine plants with a calcareous layer, so as entirely to conceal their form and colour; whilst others merely appear like powder or mouldiness on the surface of the plants, according to the size of the patches, which resemble small scales or atoms of dust. On these patches may be discerned projecting tubercles, having in their centre a small hole, or cell, which serves as a dwelling for the polypus or constructor of this stony habitation.

Their colour is the same as that of the Corallinas, either fresh or in a dried state.

They are found on the Thalassiophytes of the various seas, generally on the same species.

MEMBRANOUS.

1. Melobesia *membranacea.* Patches very thin, nearly orbicular; some projecting cells in the centre, but invisible to the naked eye.

On the marine plants of the western coast of France.

PUSTULATED.

2. Melobesia *pustulata.* Patches round, and raised as if embossed; cells visible to the naked eye, and projecting. Plate 12. fig. 2. a. B.

On the marine plants of the French coast.

MEALY.

3. Melobesia *farinosa.* Patches of various shapes, and very thin, in general extremely small, and giving a white dusty appearance to the leaves of the Fuci; cells invisible to the naked eye, placed on the summit of small projections. Plate 12. fig. 3.

Very abundant on the Fucus linifolius.

WARTY.

4. Melobesia *verrucata.* Patches fragile, with uneven surfaces; cells placed on the top of small elevations in the form of warts.

On the Fucus of the Mediterranean.

CLASS III.

Corticiferous Polypidoms, composed of two substances, one exterior and enveloping, called RIND, *or incrustation, the other named* AXE, *placed at the centre, and supporting the first.*

GENERA

BELONGING TO THE FIRST ORDER OF THE THIRD CLASS.

Polypi none, or not perceptible.

Ephydatia. Fresh-water Polypidom, of a spongy nature; colour green; and in long masses, which are lobed or bundled together.

Spongia. Polypidom of a porous mass, lobed, ramified, turbinated or tubulous; formed of horny or leathery fibres, flexible, interwoven, or glutinated together, and surrounded or enveloped, in a living state, with a gelatinous, irritable, and very fugitive substance.

GENERA

BELONGING TO THE SECOND ORDER OF THE THIRD CLASS.

The Polypidoms of this order are usually tree-formed and inarticulated; the interior consisting of an axe, in general horny and flexible, sometimes sufficiently hard to receive a fine polish, at others whitish, soft, and corky; this axe is enveloped either in a gelatinous and fugitive exterior, or a fleshy rind of greater consistency, which is animated and frequently irritable, becoming more or less cretaceous by desiccation, and enclosing the Polypi, as well as their cells, when there are any.

Anadyomena. Fan-shaped, furrowed with articulated and symmetrical nerves; almost transparent, and enveloped with a gelatinous substance.

Antipathes. Tree-formed, simple or branched; axe horny, usually hairy or stuck with small spines, rarely smooth; rind polypiferous, gelatinous and slippery, almost wholly disappearing by desiccation.

Gorgonia. Polypidom tree-formed, simple or branched; branches dispersed or coming from the sides; free or anastomosed; axe longitudinally striated, hard, horny, and elastic, or pithy and brittle; rind fleshy and animated, becoming cretaceous by desiccation; polypi either not projecting beyond the rind, or when dead forming small tubercles on its surface.

Plexaura. Tree-formed, branching, and frequently dichotomous; branches cylindrical and stiff; axe slightly compressed; rind, in a state of desiccation, corky or earthy, very thick, and effervescing in acids; covered with large and numerous dispersed cells, frequently of unequal sizes, and never projecting.

Eunicea. Tree-formed and branching; generally compressed, and mostly so at the junction of the branches; covered with a thick cylindrical rind, irregularly set with polypean projections.

Primnoa. Tree-formed and dichotomous, with long and conical projections, internally as well as externally formed like bags or purses, which are pendent, imbricated, and covered with scales that are also imbricated.

Corallium. Polypidom tree-formed and inarticulated; axe stony, stiff, and susceptible of a high polish; rind fleshy, becoming cretaceous and very friable by desiccation, and adhering to the axe.

GENERA

BELONGING TO THE THIRD ORDER OF THE THIRD CLASS.

Tree-formed Polypidoms; composed of a rind, similar to that of the last order, but with an articulated axe; the articulations alternately horny or corky, and calcareously stony.

Melitea. Polypidom tree-formed and knotty; with branches generally anastomosised; stony articulations, substriated; the intermediates spongy and swelled; rind cretaceous, very thin, and friable in a state of desiccation; polypi on the surface, or tubercular.

Mopsea. Tree-like, with pinnated branches; rind thin and adherent, covered with very small but long bags, bent in towards the stem, dispersed or subverticillated.

Isis. Tree-like Polypidom; rind very thick, friable, not adhering to the axe, from which it is easily detached; cells dispersed and superficial.

Adeona. Stem articulated like the axes of this order, but surmounted with a fan-shaped expansion, which is irregularly sown with small cells on each of its surfaces, and pierced with round or oval apertures.

CLASS III.—ORDER I.

GENERA AND SPECIES.

EPHYDATIA.

Polypidoms of fresh water; spongy in their nature, greenish, in long masses, which are lobed or bundled together.

Recent observations have decided on the removal of this genus from the vegetable tribes, among which former philosophers had placed it, and have now stationed it among the Polypidoms of the Spongia, chiefly distinguishing it from that genus by its fresh-water residence. It resembles the marine Spongia by the gelatinous mucus which surrounds the mass and fibres, and which disappears on desiccation; by the very fetid smell it yields when burning or decomposing, and also by the quantity of lime extracted from its ashes, which even sometimes exceeds half the weight of the dried Polypidom.

They differ from the marine Spongia by their fresh-water habitation, and by their disagreeable smell when first taken from the water.

These singular beings are yet but little known; no exotics are to be found among the collections. It is however probable that the fountains, rivulets, and rivers of other regions contain them as well as our own; but they have not been sufficiently attractive hitherto to catch the attention of voyagers, occupied in more important objects, or engaged by forms more elegant, or colours of greater brilliancy.

The Ephydatias are seldom of the same form; their colour is green, of different shades, apparently varying with the nature of the body to which they adhere.

They inhabit fresh and limpid waters, covering stones, roots, and almost every substance that comes within their reach; frequently acquiring considerable size.

CANAL.

1. Ephydatia *canalium*. Branching and dichotomous; branches round and bent.

In an aqueduct.

FLUVIATIC.

2. Ephydatia *fluviatilis*. Upright, fragile, and of no particular form.

In ponds.

FRIABLE.

3. Ephydatia *friabilis*. Ashy, friable, sessile, without form, and a little branching.

In a lake near Buda.

LAKE.

4. **Ephydatia** *lacustris*. Spreading, and fragile; branches upright, cylindrical, and obtuse.

In the lakes of the north of Europe.

SPONGIA.

Spongy, inarticulated, and porous Polypidoms, formed of fibres crossed and interwoven in every direction, never tubular, but covered with a fugitive and gelatinous matter, which according to some authors is irritable.

The preceding description of the Spongias, in general, being found every way applicable to the Ephydatias, established the opinion of their alliance to that genus.

The marine Spongias are characterised as a very porous mass, lobed, ramified, turbinated or tubulous, formed of horny or leathery fibres, which are flexible, interwoven or agglutinated together, and in a living state covered with a gelatinous, irritable, and very fugitive matter.

It is difficult to define the characters which constitute the various species of the Spongia; the form alone is insufficient, without an additional detail on the nature, the quantity, the arrangement, and the colour of their fibres.

Considered in relation to their substance, or rather their texture, the differences they exhibit are considerable; in the thickness of the fibres, for instance, some of them resemble the Antipathes, having their branches anastomosised, whilst others are composed of fibres as fine as the threads of silk, and wove as close as down, or the hair of beaver when formed into hats; every intermediate gradation between these two extremes is to be met with.

In the texture of the Spongias it is also observable that they have their holes of different sizes and depths, sometimes regularly and sometimes irregularly disposed: of the use for which these holes (which henceforth we shall denominate *oscules*) are designed, we as yet remain ignorant; but observation leads us to conclude that they answer the purpose of introducing water into the central parts of the Polypidom; so that if there are any polypi internally, they may be supplied with the necessary aliment. There are however many Spongias destitute of these oscules; the absence or presence of which, together with their form and situation, may assist in furnishing us with criteria for defining the several species: the same may be said of the variety in their texture.

I can say nothing decisive as to their colours; they appear varied, but fugitive; those authors who have been enabled to observe them in a living state, mention the colours as being numerous and bright. The few I have seen on the coasts of Calvados, when first taken from the sea, exhibited a beautiful red, or a bright citron; those dried, in collections, present us with every hue from a dirty white to a deep black, passing through fawn-colour and every intermediate shade.

Their height varies from a millemetre to a complete metre; and their diameter from the thickness of a thread to many decimetres.

We have chosen the forms of the Spongia to characterise the sections, beginning with those of shapeless masses, then taking the more regular cup or crater form, which in succeeding species becomes lobed, gradually assuming the form of branches, till the plant or tree-like sponge appears.

But these singular and useful beings, to which we are indebted for the sponge, still continue to be unknown; no research has hitherto discovered more than a gelatinous substance, resembling the white of an egg, which surrounds the sponge when undisturbed on its native site, but so fugitive that it runs immediately away when taken from its natural element.

The Spongias are very common between the tropics, less so in the temperate regions, and wholly disappear in the neighbourhood of the Polar circles.

I shall not in these limited descriptions detail the manner of procuring the sponge, but content myself with reciting two circumstances that prove the estimation in which it is held in the countries where it is procured.

In the island of Nicaria, one of the Grecian Archipelago, the young men are not allowed to marry until they have given proofs of their skill in diving for the sponge: Hasselquist also mentions a small island named Himia, near Rhodes, where the young women cannot marry until they have dived an appointed depth, and procured a certain quantity of sponge.

SECTION I.

Masses sessile, simple or lobed, either covering or enveloping.

COMMON.

1. SPONGIA *communis.* Masses rather large, spreading, and slightly convex upon the top, soft, tough, and coarsely porous; scooped out and jagged particularly below, exhibiting round holes, mostly very large.

Red Sea, Indian Ocean, and perhaps in the Mediterranean.

JAGGED.

2. SPONGIA *lacinulosa.* Surface rather finely porous, and stuck with numerous little jags or risings, which are soft, and make it appear downy; lobed above, or pierced with holes of a middling size, having their borders ciliated with those little spongy jags, called *lacinules,* from whence it derives its name.

Found in the Red Sea and Indian Ocean, and is not unfrequently used as a substitute for the common sponge *(S. communis)* for domestic purposes.

SINUOUS.

3. SPONGIA *sinuosa.* Oval and sessile; texture fibrous, stiff, and partially incrustated; surface covered with numerous and deep holes, crevices, and sinuosities.

Indian Ocean.

CAVERNOSE.

4. **Spongia** *cavernosa.* A kind of conic oval; stiff, rather hard, and very full of cavities; surface studded with small risings, and irregularly porous.

American seas.

CARIOUS.

5. **Spongia** *cariosa.* Shapeless and irregularly lobed; furrowed, and caverned, as if bitten; texture fibrous, rather finely reticulated with irregular meshes; surface covered with crevices and holes.

Indian Ocean.

LICHEN-FORMED.

6. **Spongia** *licheniformis.* Sessile, rugged, and clustered; fibres very loose, crossing and anastomosing together, branching and tough.

Found in many seas, and varying in form.

BEARDED.

7. **Spongia** *barba.* A long mass, loosely reticulated, strongly resembling a goat's beard, or the Lichen barbatus.

On the Spondylus Gœderopus of the Mediterranean.

FASCICULATED.

8. **Spongia** *fasciculata.* Stiff, and nearly globular, formed by bundles of fibres, prism-shaped and branching.

Mediterranean.

LACERATED.

9. **Spongia** *lacera.* Sessile, oval, and convex;

the interior full of small *lacinules;* surface many-lobed, divided, and laciniated; texture fibrous and reticuated; slightly incrusted.

FILAMENTOUS.

10. SPONGIA *filamentosa.* Orbicular; the surface covered with upright lobes, separated above and united below by lateral transverse filaments.

Seas of New Holland; King's Island.

HONEY-COMBED.

11. SPONGIA *favosa.* Masses oval, or oblong, and convex; surface covered with cells like a honey-comb, subangular and unequal, of which the sides are nearly membranous.

Australasia; King's Island.

CELLULAR.

12. SPONGIA *cellulosa.* Masses proliferous or lobed; surface covered with honey-combed unequal cells, whose sides are thick and porous.

Australasia; King's Island.

PARTITIONED.

13. SPONGIA *septosa.* Fibres completely incrusted, forming a sort of net-work, the layers of which irregularly cross each other and form large and unequal cells or holes.

Southern seas.

PIERCED.

14. SPONGIA *fenestrata.* Simple and incrusting,

with a level surface, but irregularly creviced; fibres stiff, reticulated, and almost bare.

Indian ocean.

THICK-LOBED.

15. SPONGIA *crassiloba.* Incrusting, with several upright lobes, which are thick and compressed, between an oval and cone in form, but obtuse, having round holes upon the borders, irregularly ranged.

TABULATED.

16. SPONGIA *tabula.* Mass flat like a small plank; sides transversely and irregularly undulated, with holes on the summits of the risings; texture fibrous, a little woolly, very porous, and slightly incrusted.

Australasia.

CAKE-FORMED.

17. SPONGIA *placenta.* Form obliquely orbicular, and marked with rayed furrows; texture firm and very porous, fibrous, and reticulated; holes very few, and not large.

Australasia; King's Island.

GAUZY.

18. SPONGIA *byssoïdes.* Mass simple, sessile, and oblong, more or less swelled, spread upon marine bodies; texture very loose, transparent, gauzy, and fibrous.

Australasia.

CUSHION.

19. SPONGIA *pulvinata.* Sessile, oval, cushion-formed, and scantily lobed; colour orange, and sometimes olive.

Australasian seas.

COAL.

20. Spongia *carbonaria.* Unshapely, very stiff, and black; texture fibrous, reticulated, and very porous.

On the Millepora Alcicornis of the American seas.

INCRUSTING.

21. Spongia *incrustans.* Mass forming a thin, fibrous, rose-coloured layer, on the surface of a fucus; texture reticulated, fibrous, loose, and irregular, with rather large holes.

Southern seas.

AGARIC.

22. Spongia *agaricina.* Compressed, lobed, sessile, reticulated, prickly, and osculated.

Indian ocean.

CRESTED.

23. Spongia *cristata.* Even, upright, and soft; pores projecting and regularly placed.

Coasts of France and England.

COTTAGE.

24. Spongia *domuncula.* Convex; surface smooth, but covered with little papillæ; very cellular within.

Gulf of Genoa.

GLOBULAR.

25. Spongia *globosa.* Tough, and very cellular; surface covered with simple or branching protuberances, elongated and rather stiff.

Gulf of Genoa.

LANK.

26. **Spongia** *macida*. White, crustaceous, and rising in spines.

Norwegian seas.

BREAD-LIKE.

27. **Spongia** *panicea*. Shapeless and diffuse masses, not more than a finger in thickness; substance white, very finely cellular; surface sleek, and slightly porous.

European seas.

PAPILLARY.

28. **Spongia** *papillaris*. Crustaceous; surface covered with conic protuberances more or less elevated, either distinct or coalescent, and in some measure tubulous; substance soft and friable by desiccation.

American seas.

BURNING.

29. **Spongia** *urens*. Of various shapes, porous, somewhat prickly, and downy.

Western shores of Europe and of North America; said also to be found in Africa and India.

NEEDLE-FORMED.

30. **Spongia** *acicularis*. White and solid, externally porous and hard; internally composed of bundled and upright fibres, converging towards the centre.

Gulf of Genoa.

N. B. Not improbably an Alcyonia.

SECTION II.

Masses subpediculated or contracted at their base, simple or lobed.

ANGULAR.

31. **Spongia** *angulosa.* Masses upright, nearly turbinated, with longitudinal angles, compressed and irregular at the sides; fibres very fine and reticulated; holes orbicular and distinct, formed on the flattened or imperfect projection of the angles.

Var. B. Shapeless, and almost lobed.

Australasia ; King's Island.

MANY-LOBED.

32. **Spongia** *pluriloba.* Upright, contracted at the base, compressed, deeply and irregularly lobed; lobes flattened, and obtuse as if truncated at their summit; oscules scattered, distant, and sometimes rather projecting.

Seas of Australasia.

CHINKY.

33. **Spongia** *rimosa.* Fibrous, but not incrusted; surface marked with irregular and longitudinal crevices sometimes oblique; oscules dispersed.

Var. A. In the form of a column.

Var. B. In the form of a club, rather compressed.

Australasian seas.

PENCIL-FORMED.

34. SPONGIA *penicillosa.* Surface stuck with small pencil-like brushes, which are stiff and upright.

Var. A. In the form of a club.

Var. B. Shorter, and nearly globular.

Australasia.

PROTUBERANT.

35. SPONGIA *turgida.* Mass substipited, gibbous, and fibrous; summits pierced with three or four separate oscules, or with a single terminating hole.

Var. A. Upright, gibbous, and with three oscules.

Var. B. Mass oval, oblique, and with a single hole.

Australasian seas.

SILKY.

36. SPONGIA *bombycina.* Form oval, swelled, or bulging, divided at the summit into short and upright lobes; texture loose; fibres bare, crossed, interlaced, and of a scarlet colour; surface hairy and curly.

Var. B. Smaller, bulging, and almost compressed.

Australasian seas.

FLAMMEOUS.

37. SPONGIA *flammula.* Generally simple, rather upright, and of a lanceolated oval form; summits ob-

tuse and rather flattened; the longitudinal fibres stronger than the transversal or diverging ones.

Var. B. Protuberant, and nearly oval.

Australasian seas.

MYROBALAN.

38. **Spongia** *myrobolanus.* Small, pediculated, and of an oval form, slightly compressed, more or less oblique ; texture fine and closely compacted,

LION'S FOOT.

39. **Spongia** *pes-leonis.* A very short pedicle, supporting an oval or round compressed mass, of a soft and porous texture; the upper border osculated.

Southern seas.

GOOSE-FOOT.

40. **Spongia** *anatipes.* Wholly fibrous, greyish and transparent; longitudinal fibres stronger than the transversal, forming an imperfect net-work with long meshes ; pedicule hard and porous.

Southern seas.

RED.

41. **Spongia** *rubra.* Simple, tough, nearly round or compressed, osculated, and porous ; tubercles projecting.

Red Sea, near Suez.

FLAT.

42. **Spongia** *plana.* Extended, crustaceous, and fan-shaped.

Sea of Norway.

MUSHROOM.

43. **Spongia** *peziza*. Of a yellow colour; branches rising out of the cavities of stones, in the form of a small mushroom.

Charlestown, in America.

N. B. The foregoing species is only found in the cavities of stones and pieces of wood that are in the sea; they fill up the interior, and project from their orifices in the form of small yellow fungi.

BLACK.

44. **Spongia** *nigra*. Globular, tough, and solid; black externally, and grey within.

In the Red Sea, near Suez.

SECTION III.

Masses pediculated, flattened, fan-shaped, simple or lobed.

PALLET-FORMED.

45. **Spongia** *plancella*. Flat, a truncated oval, not very thick, and in some parts uneven; rather curved on one of its borders; texture a little incrusted, and finely porous.

SHOVEL-SHAPED.

46. **Spongia** *pala*. In the shape of a shovel or spade, fibrous and not incrusted, upright, simple or proliferous, and osculated on the upper border.

Var. B. Surface proliferous and lobed; lobes cylindrical and nearly tubulous, fixed through their whole length.

Var. C. Spatulated, and very thick.

Var. D. Surface jagged, and proliferous.

Australasia; near Kangaroo Island.

FAN-SHAPED.

47. Spongia *flabelliformis*. Upright, pediculated, brown or blackish; fibres stiff, reticulated, and incrusted.

Indian and Australasian seas.

FEATHERED.

48. Spongia *pluma*. Pediculated, finely fibrous as if feathered; transparent, and a little flattened.

Southern seas.

THISTLE.

49. Spongia *carduus*. Pediculated, fan-shaped, and uneven; surface incrusted, and having thin continuous wrinkles or folds, stuck with a few sharp points.

Southern seas.

CLOTH-LIKE.

50. Spongia *pannea*. Upright, pediculated, and very thick, flattened and fan-shaped; texture fibrous and reticulated, like cloth; upper border osculated.

Var. B. Very thick, compressed, and round.

Southern seas.

CLEFT.

51. Spongia *fissurata*. Pediculated, flat, and thin;

fan-shaped, more or less lobed, and covered with small irregular crevices.

Southern seas.

LATTICED.

52. Spongia *cancellaria.* Pediculated, compressed, and fan-shaped; ramifications incrusted, coalescent, and forming a sort of irregular trellis-work; border stuck with points.

LYRE-SHAPED.

53. Spongia *lyrata.* Pediculated, upright, and composed of tubes united together; texture fibrous and reticulated; upper border osculated.

DELTA-SHAPED.

54. Spongia *deltoïdea.* Pediculated, upright, flat, and rather thin; incrusted, delta or fan-shaped, and truncated; small Alcyonic worms incrusted on each surface.

FRYING-PAN.

55. Spongia *sartaginula.* Pedicle short; expansion in the form of a frying-pan; surface convex and much osculated, and garnished with oblique tufts, in undulated series; texture fibrous, finely reticulated and incrusted.

TAILED.

56. Spongia *appendiculata.* Nearly pediculated, flattened and spatulated, with narrow lobes or appendages varying in length, nearly cylindrical, digitated, and obtuse.

SECTION IV.

Masses concave, vase, crater, or funnel-shaped.

ORDINARY.

57. SPONGIA *usitatissima.* Tough, soft, downy, and very porous; oscules disposed in rayed ranges on the sides of the cavity.

Var. B. Larger and crater-formed; the ranges of oscules running into furrows.

Var. C. Appendages in the form of lobes, both inside and outside.

American seas.

N. B. Employed for domestic uses.

TUBULIFEROUS.

58. SPONGIA *tubulifera.* Sessile, soft, and very porous, extending at the sides in angular and projecting lobes, which are tubulous and disposed like stars.

Supposed to originate in the American seas.

STARRY.

59. SPONGIA *stellifera.* Large, and formed like a deep crater; soft, rather thin, and very porous; the interior osculated; oscules star-shaped.

Var. B. Very large, in form resembling an ear.

Probably America.

STRIATED.

60. SPONGIA *striata.* Funnel-shaped, slightly

compressed, and black; striæ thorny, and longitudinally placed on each surface.

Supposed to originate from America.

BELL-SHAPED.

61. **Spongia** *campana*. Large, rough, and stiff, in the form of an upright bell; fibres incrusted, inner surface osculated.

American seas.

TURBINATED.

62. **Spongia** *turbinata*. In the form of a long funnel, rather narrow, stiff, and very simple; internally marked with longitudinal striæ and small osculiferous jagged risings.

American seas.

CRUCIBLE.

63. **Spongia** *vasculum*. Turbinated and thick; surface smooth; border woolly.

CABBAGE-FORMED.

64. **Spongia** *brassicata*. In the form of a large open foliated cup, or resembling a cabbage whose under leaves alone are expanded.

Indian Ocean.

GOBLET-FORMED.

65. **Spongia** *cyathina*. Crater-form, simple and incrusted; surface elegantly and very finely cleft, sown with small oscules.

Southern seas.

OTAHEITAN.

66. Spongia *Othaïtica.* Crater-formed, divided, or deeply incised and lobed; incrusted with large hollows, whose borders are raised, studded, and spongy, but without incrustation.

Australasian and Atlantic seas.

RIBBED.

67. Spongia *costifera.* Turbinated; the external partitions furnished with longitudinal ribs rather sharp-edged, appearing like narrow planks; texture fibrous, stiff, without incrustation.

Southern Ocean.

VASE-FORMED.

68. Spongia *labellum.* In the form of a vase with an elliptical opening, whose borders are undulated and festooned; sides stiff, resembling leather or pasteboard, with longitudinal nerves, from which spring smaller ones in trellis form.

CUP-FORMED.

69. Spongia *pocillum.* Irregularly formed like a chalice, stiff like woollen cloth, partly incrusted, and very porous; exterior surface finely cleft, the interior more bristled or prickly, and almost granulated.

Northern seas.

VEINED.

70. Spongia *venosa.* Turbinated and very wide; thin, incrusted, and reticulated; net-work formed by veins or small longitudinal nerves.

Supposed to originate from the Indian Ocean.

BASKET-SHAPED.

71. Spongia *sportella.* Formed by an union of ligneous nerves, whitish or yellow, bare and smooth, having the appearance of an open funnel-shaped basket.

Coast of Madagascar.

PURSE-FORMED.

72. Spongia *bursaria.* Mass fan-shaped, more or less flattened, formed by three or five tubes or purses, which are spongy, cuneiform, flattened, and united by their narrow sides.

TWO-LEAVED.

73. Spongia *bilamellata.* A short pedicle, rather funnel-shaped, terminated by two large thin upright expansions, which are parallel, approximate, and fan-shaped.

Var. B. Expansions nearly smooth externally.

Southern Ocean.

CUP-FORMED.

74. Spongia *calix.* Pediculated, upright, and resembling a calix; the internal cavity contracted by gibbous irregularities.

Southern Ocean.

FIG-SHAPED.

75. Spongia *ficiformis.* Stiff and turbinated; the summit pierced.

Coasts of Barbary.

COMPRESSED.

76. Spongia *compressa.* Simple, conical, and compressed; internally cloven lengthways.

Greenland seas.

RUGGED.

77. Spongia *lacunosa.* Simple, cylindrical, tubulous, and very thick; deep clefts on the outside, sinuous and irregular.

TUBULAR.

78. Spongia *tubæformis.* Tubes long, coarse, and simple, united at their base; tubercular on the external surface, as if granulated.

American seas.

CANDLE OF THE SEA.

79. Spongia *fistularis.* Tubes long and narrow; fibres bare, stiff, reticulated, loosely and visibly interwoven.

American seas.

PLIABLE.

80. Spongia *plicifera.* Tube inclining to funnel-shape, flexible, very much wrinkled; fibres slightly incrusted; on the outside are numerous folds and jags; in the inside dispersed cells resembling a honeycomb.

American seas.

FURROWED.

81. Spongia *scrobiculata.* Funnel-shaped and flexible; the two surfaces covered with little round and unequal pits resembling dimples.

SHEATHY.

82. Spongia *vaginalis*. From six to nine bundled and coalescent tubes, slightly incrusted, hard and brittle ; surface osculated, and stuck with compressed tubercles which terminate in a point.

American seas.

FINGERED.

83. Spongia *digitalis*. One or two short, united, and flattish tubes, which are rough, stiff, and rather prickly from the numerous little asperities on the surface.

Var. B. With long tubes.

Indian and American seas.

STUDDED.

84. Spongia *bullata*. Tubes knotty, more or less coalescent, and incrusted ; composed of semi-transparent blisters, of a very fine and fibrous texture ; the terminal opening gathered in.

Var. B. Tubes very short, numerous, and diffuse.

The first is found in Australasia, the second in the Indian Ocean.

SIPHON.

85. Spongia *syphonoïdes*. Tubes upright, drawn out in form of a siphon, flabby, semi-transparent, bifurcated or trifurcated, insensibly contracting towards their base.

Var. B. Scarcely any incrustation.

Isles of St. Peter and St. Francis, in Australasia.

DISTAFF.

86. Spongia *colus*. Pediculated, upright, and in

the form of a club, fibrous, and irregularly hollowed on the outside.

Var. B. Semi-proliferous, opening into a kind of compressed calix, cavities larger and fewer.

Kangaroo Islands, in Australasia.

TUBULOUS.

87. SPONGIA *tubulosa.* Branching, cylindrical, irregular, waved, osculated, and with a few strong hairs; texture fibrous, rather finely reticulated.

Indian ocean.

PRICKLY.

88. SPONGIA *muricina.* Tubes cylindrical and nearly branching, long, and covered with sharp and scattered tubercles.

Var. B. Tubercles smaller and more numerous.

Seas of Australasia.

CONJUNCT.

89. SPONGIA *confœderata.* Tubes upright and numerous, united in a mass that is rather thick and compressed, the upper border being sometimes divided in digitations; some of the tubes adhering only to the base of the mass.

Seas of Australasia.

INTESTINAL.

90. SPONGIA *intestinalis.* Lobed, fibrous, stiff, and internally hollow; lobes unequal, cylindrical, and fistular, with holes or clefts.

Mediterranean; near Cette.

CROWNED.

91. **Spongia** *coronata.* Tubulous, simple, and very small; crowned with a radiation of thorns.

Coasts of France and England.

TUBULAR.

92. **Spongia** *tubularia.* Sessile, semi-oval, compressed, stiff, and pierced with longitudinal tubes; external border convex.

Seas of America.

CILIATED.

93. **Spongia** *ciliata.* Simple, tubulous, conical, tortuous, thin and ciliated at the extremity.

Coast of Greenland.

SECTION V.

Masses foliated, or divided into flat lobes in the shape of leaves.

FOLIATED.

94. **Spongia** *perfoliata.* Stem simple, upright, hollow, and leaved; lobes round, foliaceous, resembling the leaves of a Crassula, incrusted, and placed spirally round the stem.

Australasian seas.

N. B. This species is the most extraordinary and remarkable of any known Spongia.

PINNATED.

95. SPONGIA *pennatula.* Stem arched and twisted, supporting flat leafy pinules, which approximate and stand out in a sort of crested tuft; surface incrusted, and very porous.

Australasian seas.

ARTICHOKE.

96. SPONGIA *cactiformis.* Pediculated and branching; expansions flat, cuneiform, fan-shaped, rounded or truncated at the summits, nearly lobed, proliferous, and slightly incrusted; small dispersed excavations on the surface.

Southern seas.

CURLED.

97. SPONGIA *crispata.* Foliaceous expansions, proliferous and conchoidal, turned in like the border of an ear; they are irregular in form, and appear blistered, coalescing in some parts, and unequally punctured; texture fibrous, and very fine.

Southern seas.

BLACK-PLUMED.

98. SPONGIA *basta.* Expansions fibrous, leafy, turned in as if curled, laciniated, enclosed one within the other, and appearing like a small black plume; fibres bare, rather stiff, and disposed like a loose net.

Indian Ocean.

LAMINATED.

99. SPONGIA *lamellaris.* In thin parallel laminæ,

upright, approximate, soft, and more or less coalescent; texture fibrous, and very fine.

Indian and Australasian seas.

ENDIVE.

100. **Spongia** *endivia*. Laminæ soft, spatulated, rounded, lacerated and crisped at their borders, and disposed like the petals of a rose; texture fibrous, and longitudinally channelled.

PITCHER-SHAPED.

101. **Spongia** *urceolus*. Oblong-oval, greenish and pedunculated; summit narrow and perforated.

Norway.

MAMMILLARY.

102. **Spongia** *mammillaris*. Shapeless and cavernose, with tubular and projecting fibres; tubes conical and flexuous.

Norway.

MANY-LEAVED.

103. **Spongia** *polyphylla*. Pediculated upright leaves, wedge-shaped, rounded at the summits, slightly lobed, rolled in the form of a coronet, frequently coalescent, irregularly hollowed, and with longitudinal nerves stronger on one side than the other.

Indian Ocean.

PEACOCK'S-TAIL.

104. **Spongia** *pavonia*. From a stiff and compressed pedicle spring many foliated expansions, ob-

liquely rounded, and productive of smaller; incrusted and punctured on one side.

Australasian sea.

SCARIOLA.

105. **Spongia** *scariola*. Expansions punctured and dividing into a multitude of upright laminæ, which are soft, laciniated, lobed, and variously turned as if curled or crimped.

Southern seas.

HETEROGONOUS.

106. **Spongia** *heterogona*. Expansions upright and flat, fibrous, slightly incrusted, and rolled back so as to form imperfect tubes; internally furnished with longitudinal and detached nerves; externally set with points nearly resembling thorns, rather large, and numerous.

TIARA-SHAPED.

107. **Spongia** *tiaroïdes*. Laminæ upright and bundled, rather thick, frequently coalescent, and much lobed in the upper part; lobes narrow, terminated in a cone and set with points.

SEAR-LEAF.

108. **Spongia** *xerampelina*. Stem short, and corky in appearance; expansions flat and foliaceous, oval or oblong-oval, slightly incised and lobed; nerves projecting and forming a net-work; honey-combed oscules in the interstices.

Var. B. More loose in form, expansions deeply laciniated, and oscules more numerous.

Northern and American seas.

JUNIPER.

109. Spongia *juniperina*. Foliaceous expansions, incrusted, rough; oval, round, or three-sided; formed of a multitude of small branches, partly united, partly detached, and disposed in the form of a fan.

Var. B. Cypress-formed; expansions latticed, and very porous.

Indian Ocean.

RADISH.

110. Spongia *raphanus*. Expansions foliaceous, strongly furrowed on each side, and stiff; texture fibrous, woolly, and slightly incrusted.

Southern seas.

MESENTERIC.

111. Spongia *mesenterina*. Growing in laminæ, upright and turbinated; laminæ large, in folds, truncated at the summits, sometimes lobed, with circular undulations.

Southern seas.

LEPORINE.

112. Spongia *leporina*. Deeply cut in thin straps, smooth and oblong, widening at the summits, obtuse, a little incised, lobed, and incrusted.

Southern seas.

LACINIATED.

113. Spongia *laciniata*. Laminæ leaf-shaped and rather thin; cut almost in the shape of a lyre or lance-head, and soft; fibres bare and interlaced; surface like velvet, but cleft or flawed, with dispersed oscules.

Indian Ocean.

LEAFY.

114. SPONGIA *frondifera.* Somewhat branching, divided in unequal lobes, which are proliferous; the last of the lobes being the largest, less irregular, more foliaceous, incrusted, compressed, and as if bearded or fringed on the upper border; oscules scattered, and nearly star-formed.

Var. B. Less shapely, with a more compact crust.

FRINGED.

115. SPONGIA *fimbriata.* Lobes leaf-formed, pediculated, broad, a little incrusted, covered with unequal pores like punctures; borders garnished with crisped or curled fibres.

SECTION VI.

Masses branching, plant or tree-formed; ramifications distinct.

ARBORESCENT.

116. SPONGIA *arborescens.* Stem firm and almost cylindrical; branches standing out, a little compressed, but widening, palmated or digitated at the summit; oscules scattered, and sometimes pretty regular.

Var. B. Lobes longer and upright.

Var. C. Lobes long, compressed, narrow, straight, and approximate; borders osculated.

American seas.

ROD-SHAPED.

117. **Spongia** *virgultosa.* Stem hard, upright, and unequally cylindrical; branches stretching out in the form of rods, upright, spriggy, unequal, and terminating in obtuse points; surface velvety and osculated.

Var. B. Branches flexuous and diverging.

Seas of the north of Europe.

LONG-POINTED.

118. **Spongia** *longicuspis.* Base forming a coarse trellis, supporting from six to nine long upright branches, which are sometimes coalescent, forming slender digitations, or long points.

Southern seas.

ASPARAGUS.

119. **Spongia** *asparagus.* Upright and branching; branches in the form of rods, unequally cylindrical, and rather obtuse at the summits; incrustation not thick; oscules almost disposed in series.

Seas of Australasia.

DICHOTOMOUS.

120. **Spongia** *dichotoma.* Upright; branches cylindrical, hairy, and lateral.

Var. B. Branches tortuous, frequently anastomosed.

Sea of Norway, and Mediterranean.

BRISTLED.

121. **Spongia** *echidnæa.* Corky and branching;

branches stiff, upright, divided, cylindrical, pointed, subangular, and hairy; spiny on their surface.

Western coast of France.

PRICKLY.

122. Spongia *muricata.* Stem long and branching; branches loose, few, simple, tough, tail-shaped, and stuck with linear obtuse projections, which are spatulated and very close.

Western coast of Africa.

VULPINE.

123. Spongia *vulpina.* Upright, branching, and incrusted; branches tail-shaped, thickly covered with small projections, which are divided, frequently coalescing in trellis form, and irregularly porous.

Southern seas.

SPIKED.

124. Spongia *spiculifera.* Whitish mass, deeply cut in upright lobes, which are proliferous, and resemble ears of corn; porous, osculated, and stuck with small tubercles.

Seas of Australasia.

THISTLE-SHAPED.

125. Spongia *carlinoïdes.* Resembling a small thorny bush, in a fan-like tuft, whose ramifications resemble the leaves of the Carline thistle; surface incrusted.

AMARANTHINE.

126. Spongia *amaranthina.* Upright, branching,

and very porous; branches compressed, but dilating towards the summit, and longitudinally channelled; texture fibrous, spongy, slightly incrusted, having numerous and dispersed oscules.

CURRY-COMB.

127. SPONGIA *strigilata.* Stem short, and nearly cylindrical, dividing into six or eight flat branches, fan-shaped, and stuck with numerous and unequal risings, which are slightly compressed, and appear disposed in longitudinal ranges.

NERVOUS.

128. SPONGIA *nervosa.* Nearly fan-shaped, and branching; branches divided, but partly coalescent, flattening and dilating a little towards the summits, where they are almost laciniated; nerves longitudinal, slender, and reticulated, more numerous on one surface than the other.

Indian Ocean.

BRAMBLE.

129. SPONGIA *rubispina.* Branching; the fan-like branches stuck with prickly tubercles resembling those of the bramble, and covered with a leathery crust.

FIR.

130. SPONGIA *abietina.* Pillared, branching, and expanded; ramifications narrower, and more pliable, covered with thorny appendages, which are terminated by a horny filament.

ELONGATED.

131. SPONGIA *elongata.* Caudiform, and cylin-

drical; branches short and few, forming sometimes only a simple tuberosity, situated in the upper part; texture fibrous, reticulated, bare, and osculated.

Southern seas.

SELAGO.

132. Spongia *selaginea.* Very branching; branches diffuse, stiff, incrusted, rough to the touch, compressed, attaching to soft bodies, and charged with small longitudinal tufts, which are somewhat thorny, and numerous.

ROUGH-HORNED.

133. Spongia *aspericornis.* Branching, and slightly porous; branches loose, numerous, nearly cylindrical, lengthened in the form of horns, and stuck with pointed tubercles, which are stiff and prickly; fibres slightly incrusted.

Var. B. Branches large and compressed.

Australasian seas.

RUGGED.

134. Spongia *hispida.* Soft, branching, and irregular; branches cylindrical, proliferous, coalescing at intervals, obtuse, and osculated; fibres very fine, interlaced, and almost bare.

Southern seas.

SERPENTINE.

135. Spongia *serpentina.* Very branching; branches cylindrical, irregular, mis-shapen, soft, and diffuse; texture very fine, fibrous, and scarcely incrusted; oscules scattered and distant.

Var. B. Branches upright, rather compressed, and incrusted.

Australasia.

OCULATE.

136. Spongia *oculata.* Branching, upright, tough, and cylindrical; branches obtuse; oscules small, and almost double.

European Ocean.

SAUSAGE-SHAPED.

137. Spongia *botellifera.* Stem short and narrow, dividing into upright branches, irregularly tubercled, jagged, blistered, and resembling small ill-shapen sausages; surface osculated.

South seas.

PALMATED.

138. Spongia *palmata.* Stem short, thick, compressed, and incrusted; ramifications palmated, flat, with bare and wide digitations, which are lobed, forked, and sometimes three-forked at their summits; scattered oscules.

Var. B. Branches longer, and dilated towards the summit, with the extremities forked and pointed.

The first, in the seas of Europe and India; the second, in the seas of Australasia.

WOOLLY.

139. Spongia *lanuginosa.* Branching, dichotomous, rather compressed at the ramifications; branches cylindrical, slender, and upright; fibres bare, very fine, interlaced, and woolly.

TYPHINE.

140. Spongia *typhyna.* Branching and soft;

branches upright and cylindrical; surface unequal, a little jagged, and partly striated; fibres in bundles or long locks.

Australasia.

TUPHA.

141. **Spongia** *tupha.* Branching, soft, and very porous; branches ascending, few, cylindrical or slightly compressed, obtuse at the summit, and nearly resembling straps; texture a little incrusted.

Mediterranean.

ARCHED.

142. **Spongia** *fornicifera.* Spread out at the base, and branching; ramifications flattening as they expand, anastomosing, and forming arches and arcades.

Mediterranean.

SEMI-TUBULOUS.

143. **Spongia** *semitubulosa.* Soft, and very branching; small branches cylindrical, variously tortuous, almost united, and sometimes half tubulous.

Mediterranean.

ELK-HORNED.

144. **Spongia** *alcicornis.* Tufts of many stems; stems branching, and flattening at the commencement of the branches; ramifications irregular, attenuating in straps that are slender towards the summit; oscules small, and dispersed on the wider parts.

DEER-HORNED.

145. **Spongia** *damæcornis.* Tufts formed of many

stems; branches short, wide, palmated at the extremities, and hollowed on one of their surfaces.

TAILED.

146. **Spongia** *caudigera.* Upright, compressed, and palm-branched; upper ramifications presenting long upright tails in very distinct net-work.

Indian Ocean.

MAILED.

147. **Spongia** *loricaris.* Branches loose and narrow like straps, a little compressed, divided, irregularly curved, and porous; fibres adhering.

LATTICED.

148. **Spongia** *cancellata.* Branching, fan-shaped, and incrusted; branches cylindrical, flexuous, anastomosed, and forming a fan-shaped net; surface finely reticulated.

TOW-LIKE.

149. **Spongia** *stuposa.* Branches short, cylindrical, a little incrusted, obtuse, nearly dichotomous, hairy, and of the consistence of tow.

European Ocean.

LINEN.

150. **Spongia** *linteiformis.* In a round tuft; the branches rather narrow, laciniated or fringed, rough and harsh to the touch.

Var. B. Branches nearly membranous, anastomosed in net-work.

Indian Ocean.

CROSS-BARRED.

151. **Spongia** *clathrus.* A conglomerate tuft, nearly globular, soft to the touch, composed of short branches which are tortuous, anastomosed and osculated, with obtuse and swelled summits.

COALESCENT.

152. **Spongia** *coalita.* Base an expanded membrane, enveloping many bodies, and dividing itself into proliferous branches, soft and pleasant to the touch; surface irregularly reticulated.

Northern Ocean.

PITTED.

153. **Spongia** *foveolaria.* Branching, long, and blackish; branches anastomosing, nearly cylindrical, and conical at the summit; the outside covered with small unequal pits having ragged borders.

Mediterranean.

LONG-FINGERED.

154. **Spongia** *macrodactyla.* Branching and long; branches nearly alternate, long, and partly compressed, unequal, attenuated, upright in the lower part, and curved in the upper.

Indian Ocean.

CLUSTERED.

155. **Spongia** *botryoïdes.* Branching, diffuse, but small; branches charged with triple spines, and supporting small oblong-oval lobes, hollow, and open at the summits, finely porous, and in drapery.

Coasts of England and France.

ROOT-SHAPED.

156. **Spongia** *radiciformis*. Branching, shapeless, and stiff; branches tortuous, dichotomous, and compressed at the summits.

PROLIFEROUS.

157. **Spongia** *prolifera*. Repeatedly branched and palmated, the digitations distinct; internally reticulated; the external surface set with small thorns.

North America.

OSSIFORM.

158. **Spongia** *ossiformis*. White, and almost branching; extremity swelled and osculated.

Sea of Norway.

MEMBRANOUS.

159. **Spongia** *membranosa*. Somewhat branched; osculated, externally wrinkled or garnished with soft triangular spines.

Indian Ocean.

YELLOW.

160. **Spongia** *fulva*. Branching; branches long, cylindrical, about the thickness of a quill or a finger; fibres stiff, fragile, and almost longitudinal.

American seas.

FLOWERING.

161. **Spongia** *floribunda*. Shapeless; bundles of branches, covered with a chaffy down, and thickest at their extremities.

Indian Ocean.

CRUCIFORM.

162. Spongia *cruciata.* White and branching; branches opposite, compressed, obtuse, and downy.

Sea of Norway.

STAFF-SHAPED.

163. Spongia *bacillaris.* Upright and branching; branches finely perforated.

Sea of Norway.

CLASS III.—ORDER II.

GENERA AND SPECIES.

THE Polypidoms of this order (formerly all included under the denomination of Gorgonieæ) are tree-formed, and inarticulate: the interior consists of an axe, generally horny and flexible, but sometimes of sufficient hardness to receive a high polish; at others it consists of a whitish substance, very soft, and resembling cork; this axe is enveloped in an exterior which is gelatinous and fugitive, or fleshy and solid, animated, and frequently irritable, becoming more or less chalky when dry, and enclosing the animals as well as their cells when there are any.

GENERA

BELONGING TO THE SECOND ORDER OF THE THIRD CLASS.

ANADYOMENA.

A FAN-FORMED Polypidom, with articulated and symmetrical nerves, almost transparent, and enveloped in a gelatinous substance.

As only one species is known to constitute this genus, it has long remained a doubt whether to class it with animal or vegetable productions: even the power of chemical analysis has been found insufficient to solve the difficulty, as many Thalassiophytes appear to yield almost the same productions as this Polypidom; nor does the microscope assist us in discovering any part we can consider as fructificative. Analogy remains our only guide, and has induced me to place the Anadyomena among the animal creation. No marine plants, whether articulated or not, present the slightest resemblance in their organization to the object in question; but that is not wholly the case with respect to Polypidoms, many of which are equally deficient in polypean cells. The substance of the Anadyomena, however, seems to be of the same nature as that of many of the Sertularias, and Tubularias; it is much more horny than that of the Thalassiophytes, and possesses a degree of stiffness and transparency which is common to some Polypidoms, but scarcely ever found in vegetables; in short, the regularity of its net-work, its form, and the gelatinous substance which covers every part of this singular being, the fibres which attach it to solid bodies, and the total absence of every thing that can give the least idea of fructification, has decided me to place the Anadyomena among the Polypidoms. The small nerves or fibres that decorate this marine production, are so elegantly and so regularly disposed, that it may be compared to the finest net-work.

Its colour on desiccation is a tarnished green.

It never exceeds three centimetres in height.

FAN-SHAPED.

1. ANADYOMENA *flabellata.* Fan-formed, and marked with articulated nerves, forming a regular net-work, resembling lace: a gelatinous substance, which doubtless is polypiferous, covers the whole surface of the polypidom.—Plate 14. fig. 3. a. B.

Mediterranean, but very scarce.

ANTIPATHES.

POLYPIDOM tree-formed, simple, or branching; axe horny, generally shaggy, or stuck with small spines, rarely smooth; rind or exterior polypiferous, gelatinous, slippery, and almost wholly disappearing on desiccation.

The Antipathes vary much in form, some exhibiting a simple stem without the slightest appearance of ramification, whilst others branch to infinity, and the branches anastomose like those of the Gorgonea *flabella ;* all the intermediates between these two extremes exist in the various species of this genus, which I believe to be naturally numerous, though former authors have noticed but a small number.

The colour of the Antipathes is but little known, as their gelatinous and slippery exterior almost wholly disappears on desiccation ; the axe or interior, which alone remains, exhibits various shades of brown or fawn, from the brightest to the darkest hue.

They vary much in size ; for whilst some scarcely reach to the height of a decimetre, we find others that measure two complete metres.

They are found in the temperate and equatorial regions, but appear more abundant in the warmer climates.

According to Rumphius, the Indian nations make use of the stems of the Antipathes for divination wands, or talismans, which are supposed to resist the power of the enchanter. The sceptres of the Indian princes are sometimes made of this Polypidom, as are also the beads used by the superstitious Bramins to count their prayers.

SPIRAL.

1. ANTIPATHES *spiralis*. Stem simple and spiral.

Var. B. Very long, and simply undulated.

Mediterranean ; and seas of Norway and India.

CORTICATED.

2. **Antipathes** *corticata.* Stem but slightly branching; branches simple, tortuous, spiny, covered with a thin rind that has neither pores nor cells; height about four decimetres.

Indian Ocean.

TRIANGULAR.

3. **Antipathes** *triquetra.* Stem triangular.

Indian Ocean.

DICHOTOMOUS.

4. **Antipathes** *dichotoma.* Stem upright, very long, and dichotomous.

Mediterranean.

WOODY.

5. **Antipathes** *boscii.* Stem flexible and branching; branches diverging; extremities setaceous; colour a deep brown; height a decimetre.—Plate 14. fig. 5.

North America.

FOX-TAIL.

6. **Antipathes** *alopecuroïdes.* Stem branching; branches in a close panicle, shaggy, and setaceous.

PYRAMIDAL.

7. **Antipathes** *pyramidata.* Stem tuberculous below, and branching; branches numerous, springing from the sides, dichotomous, shorter at the top than in the lower part, and forming an echinated pyramid; height about two decimetres.

Indian Ocean.

BRONZE.

8. **Antipathes** *ænea.* Stem simple, very straight, and bronzed; branches dichotomous, panicled, and forming a spiral line round the stem.

Indian Ocean.

BROOM-SHAPED.

9. **Antipathes** *scoparia.* Stem branching and panicled; panicle loose, inclining to a corymbus, composed of long filiform twigs, nearly upright, and thickly covered with short prickles; height from five to six decimetres.

Mediterranean.

LARCH.

10. **Antipathes** *larix.* Stems upright, very simple, above half a metre long, but not thick; rough, and thinly garnished with setaceous branches.

Mediterranean and Adriatic.

LACERATED.

11. **Antipathes** *lacera.* Stem with runners, spiny, and branched; branches twined, tortuous, and long, putting forth smaller branches, laciniated, curled, and spiny; height from five to six decimetres.

Indian Ocean.

THORN-BROOM.

12. **Antipathes** *ulex.* Extremely branched; branches scattered, open, and projecting considerably.

Indian seas.

WINGED.

13. **Antipathes** *pinnatifida.* Branches nume-

rous, alternate, open, and subdividing into smaller branches; the little branches bristled, straight, stiff, inclined to the front, and disposed in pairs or thinly scattered; height from four to five decimetres.—Plate 14. fig. 4. a. B.

Indian Ocean.

MANY-LEAVED.

14. ANTIPATHES *myriophylla*. Stems very branching, and curved; branches scattered, and rambling; pinules few, setaceous, short, erect, and sometimes ramified.

Var. B. Ramifications more upright, and less wide; height from four to five decimetres.

Indian Ocean and Mediterranean.

SEA-FENNEL.

15. ANTIPATHES *fœniculacea*. Stem much branched; branches setaceous, and irregularly pinnated; pinules discomposed.

Mediterranean.

FEATHERY.

16. ANTIPATHES *pennacea*. Stem much branched, and couching; branches pinnated; pinules very close, setaceous, and rough.

Indian Ocean.

SUBPINNATED.

17. ANTIPATHES *subpinnata*. Branching, pinnated, and rough; pinules setaceous and alternate.

Mediterranean.

CYPRESS.

18. ANTIPATHES *cupressus*. Stem simple, long,

and undulated; branches numerous, open, scattered, curved, and bipinnated.

Var. B. Stem branching; branches tail-formed.

Indian Ocean.

RADIANT.

19. **Antipathes** *radians.* Stem very short, spreading wide at the base, and branching; the branches diverging in the form of an espalier; height from sixteen to eighteen centimetres.

Mediterranean.

PECTINATED.

20. **Antipathes** *pectinata.* Stem branching and fan-shaped; branches compressed and pinnated; smaller branches setaceous, almost divided, and thinly set with spines.

WOOLLY.

21. **Antipathes** *ericoïdes.* Stem very branching, very woolly, and blackish; branches scattered, and frequently anastomosed; little branches numerous.

Indian Ocean.

TONGUED.

22. **Antipathes** *ligulata.* Fan-shaped, and finely reticulated; side ramifications flattened in the form of little tongues, widening in the middle, and forming a delicate net-work; height from twelve to fifteen centimetres.

LATTICED.

23. **Antipathes** *clathrata.* Stem very branching;

branches very close, and coiling one round the other; the latest-formed setaceous.

Indian Ocean.

FAN-SHAPED.

24. **Antipathes** *flabellum.* Stem flat, and branching; branches and smaller branches fan-shaped, lateral, and anastomosed; height from five to six decimetres.

Indian Ocean.

GORGONIA.

Tree-like Polypidom, simple or branching; the branches dispersed or lateral, single or anastomosed; axe longitudinally striated, hard, horny, and elastic, or pithy *(alburnoïde)* and brittle; rind fleshy and animated, becoming chalky by desiccation; polypi not rising above the rind, nor when dead forming more than little tubercles or protuberances on the surface.

These Polypidoms, by their size, the elegance of their form, and the brilliant colours of their envelope, first attracted the attention of Zoologists in the 17th and 18th centuries. With the assistance of the microscope, which was unknown to their predecessors, these revivers of the sciences discovered the polypi of the Gorgonias; but, either engrossed by former prejudices, or from the imperfection of their instruments, and not extending their researches beyond the European species, in general much smaller than those of a higher temperature, they mistook these little animals for the blossoms of marine vegetation. This error continued many years after the discovery of Peyssonnel, a discovery which was forgotten till Trembley's observations on the fresh-water polypi brought to the recollection of many members of the Academy of Sciences the marine Polypi of Peyssonnel; and, thanks to the investigations of Bernard de Jusias and of Guettard, the true nature of the Gorgonias, as well as that of other Polypidoms, remained no longer doubtful.

Since this period Linneus, Ellis, Pallas, Cavolini, Spallanzani, Bosc, and other learned men, have studied the polypi of the Gorgonias, and have given us the result of their observations; but their discoveries have not yet dispelled our ignorance respecting their manner of existence, or the nature of their internal organisation.

All the species of Gorgonias are attached to rocks and other marine bodies by a more or less extended base, whose surface is usually deprived of the fleshy substance which covers the other parts of the Polypidom. From this base arises a stem, which gradually diminishes in thickness up to the smallest branches, the extremities of which are often setaceous. The branches vary much in their form and respective situation; they are either dispersed or spring regularly from the sides, sometimes they are found growing double, and at others regularly pinnated; some are flexible, some straight, some curved, some single, and some anastomosed; in short, some are found slightly compressed, some nearly flat, and some angular or three-sided, but the greater number are cylindrical.

All the Gorgonias appear in their organisation to consist of two substances; the interior is sometimes horny and hard, sometimes more soft and brittle, like the blea (*alburnum*) of some trees and of many biennial plants. This interior substance seems to be composed of concentric layers, formed of longitudinal fibres. M. Lamark has given it the name of *Axe* (Axis). When the rind or exterior is thick, the axe is proportionably smaller and more compact; but larger and of a softer consistence, when the rind is thin. The surface, besides, is marked with lines and pores, by means of which, doubtless, a communication is kept up between the outer and innermost parts of the animated mass. In short, this axe in Polypidoms appears destined to perform functions analogous to those recognized in the skeletons of vertebrous animals, or the articulated and horny envelopements of insects; and it undoubtedly makes part of the animal, as the animal cannot exist without it.

The growth of the axe in the Gorgonias appears to proceed by layers, placed one upon the other. They frequently enclose in their interior, portions of the fleshy envelope, by some unknown cause deprived of life; this phenomenon seems to be effected in the same manner that the bark of trees is renewed when a part has previously experienced any injury.

The rind envelopes the axe throughout its whole extent; it is fleshy in the living state of the Polypidom, and we feel justified in the presumption that it is then irritable and susceptible: by desiccation it becomes chalky and earthy, and will dissolve in acids; it always effervesces with them.

Some authors have imagined that the cells were discernible on the exterior of this envelope ; but an attentive examination of the Polypidom has enabled me to discover in the warty Gorgonias, characterised as having projecting cells, that these cells were no other than the bodies of the polypi themselves, whose summits were crowned with their retractile tentacula. This polypus is not enclosed within a cell ; it is more or less projecting, and its exterior is a mere prolongation of the fleshy mass that forms the rind ; so that what has been hitherto looked upon as the cell and shelter of the polypus, is nothing more than a cavity destined to enclose the organs most essential to the existence of the animalcule, whose more exposed parts are found destroyed by contact with other bodies. These observations are easily made on Gorgonias that have been preserved with care ; in these the imagined cells are all obliterated, and this obliteration is produced by the part of the animal to which the tentacula are attached ; this part is sometimes clearly distinguished from the other part of the rind by a circular contraction, which gives it a rather globular appearance. In the Gorgonias of the third section (distinguished as having projecting polypi) the lower part of the body is frequently marked with transverse wrinkles, which are occasioned either by desiccation or the situation of the polypi ; these wrinkles constitute no particular character. In the species of the first section, where the animal appears not to have had the power to raise itself beyond the rind, the opening of this imagined cell is frequently garnished with cils lengthened more or less, which I take to be the tentacula of the animal; when the borders of this opening are smooth, we may either ascribe it to the destruction of the tentacula, to their diminutiveness, or to their possessing the retractile property to a greater degree than the first mentioned.

The Gorgonias vary consideraly in their form; the stem of some of them is wholly simple, devoid of any ramification; others have numerous branches, anastomosed together, and forming a net-work of very close meshes; between these two extremes are found a crowd of intermediates, forming a gradual chain of union.

The colour of the dried Gorgonia rarely exhibits brilliant hues; but in the bosom of the sea it may be very different. In the collections, some are found white, some black, some red, green, violet, and yellow, almost always tarnished by the action of the air and light, which are known to produce a very powerful effect on the colouring material of the Coralline Polypidoms, even so far as to change or destroy it almost instantaneously.

The colour of the axe is not so variable as that of the rind; it is usually a deep brown, nearly black in the opaque parts, and becoming a clear brown, fawn, or even whitish, at the extremities, or in the parts where the axe is transparent. In general the colour appears deeper in proportion as the axe is harder and more horny. In the Gorgonias of which the axe is pithy, it is whitish or yellowish; this rule applies pretty generally.

Their size varies as much as their colour; some species scarcely reach five centimetres, whilst others rise to many metres in height. If we may judge from the axe of some unknown Gorgonias I have had the opportunity of examining, and whose diameters have exceeded five centimetres (about two inches), their size must be enormous in the equatorial seas, from whence these Polypidoms originate.

The Gorgonias inhabit all seas, and are always found at considerable depths: I do not imagine they could exist in those places that are covered and uncovered by the tides. Like other Polypidoms, they are larger and more numerous between the tropics, than in the cold or temperate regions. No use either in art or medicine has yet been made of them; they have hitherto only been sought as objects of curiosity, and as ornaments to cabinets of natural history.

SECTION I.

Polypi in the interior, and not projecting; rind smooth, very rarely channelled or furrowed.

TWO-EDGED.

1. **Gorgonia** *anceps.* Panicled, and nearly dichotomous; branches flattened like a sword with two edges; polypi on the sides.

Seas of Europe and America.

PINNATED.

2. **Gorgonia** *pinnata.* Stem branching, and almost compressed; pinnated, and marked with one or

many opposite furrows; pinules almost always simple, numerous, long, linear, and furrowed; polypi long, placed laterally or on the narrowest part of the pinules; axe brown; rind violet in a living state; height from three to twelve decimetres.

Var. B. American; pinules always at the sides.

Var. C. Hairy; pinules sometimes scattered.

Var. D. Acute; pinules long, flexible, and dispersed.

Var. E. Sanguine; pinules very long, polypi of a deep purple, almost black.

Norwegian and Mediterranean seas, and coasts of Africa and equatorial America.

LOOSE.

3. **Gorgonia** *laxa*. Branches loosely palmated and flattened; the ramifications crooked; rind orange-colour, and porous; height from two to three decimetres.

FLEXUOUS.

4. **Gorgonia** *flexuosa*. Very branching, fan-shaped, and almost reticulated; branches sub-dichotomous, flexuous, and expanded; rind rather thick, corky, knotty, and friable; height from ten to fifteen centimetres.

Indian Ocean.

SPOTTED.

5. **Gorgonia** *petechizans*. Very branching; branches with two opposite furrows; rind yellow; polypi red, either simply and marginally ranged, or in double or more dispersed rows.

Atlantic and Mediterranean.

SPREADING.

6. **Gorgonia** *patula.* Compressed, tortuous, branching, almost pinnated, and of a deep red colour; polypi in two rows.

Mediterranean.

PALMATED.

7. **Gorgonia** *palma.* Compressed, branching, and almost pinnated; branches long, undulated, nearly pinnated, and cylindrical at the extremities; axe brown, horny, and closely compressed; rind scarlet; polypi small, numerous, and dispersed; height from two to six decimetres.

Cape of Good Hope, and Indian Ocean.

SANGUINE.

8. **Gorgonia** *sanguinea.* Branching, and cylindrical; ramifications slender, almost simple, ascending, and usually on the same side as the branches; axe brown; rind thin, of a scarlet colour, sown with oblong polypi rather irregularly ranged; height from four to five decimetres.

Indian Ocean.

OLIVIER'S.

9. **Gorgonia** *Olivieri.* Rather branching, and cylindrical; branches slightly flexuous; polypi dispersed, very small, and linear; colour varying from yellow to red or violet; height from two to three decimetres.

North America.

ROOT-LIKE.

10. **Gorgonia** *rhizomorpha.* Branching; branches dispersed, long, and resembling the fibres of roots;

rind brown; axe somewhat horny; polypi invisible to the naked eye.

Coast of Biaritz, near Bayonne.

VERMILION.

11. **Gorgonia** *miniacea.* Branching; branches lateral, growing upwards, and curving variously; axe, a blackish brown; rind a deep red, smooth, and thick; height from ten to twelve centimetres.

Seas of China.

SASAPPO.

12. **Gorgonia** *Sasappo.* Dichotomous, and cylindrical; branches scattered, and few; rind thick; cells stuck with hairs.

Indian Ocean: a very scarce species in collections.

FLAXEN.

13. **Gorgonia** *flavida.* Branching, almost pinnated; branches cylindrical, numerous, and rather short; rind a yellowish white; polypi dispersed; height about two decimetres.

The Antilles.

SECTION II.

Polypi projecting, and forming by their desiccation pustulent or warty excrescences; rind generally furrowed.

FLABELLATED.

14. **Gorgonia** *flabellum.* Reticulated; branches vertically compressed; rind yellowish.

In all seas.

NET-FORMED.

15. GORGONIA *verriculata.* Reticulated; wide and angular meshes; branches cylindrical; reticulations slender; polypi dispersed, rather projecting, and blackish; axe solid, ligneous, and whitish; rind greyish; height about one metre.

Coasts of the Island Mauritius.

FAN-LIKE.

16. GORGONIA *ventalina.* Reticulated; side branches externally compressed; rind red, and warty.

Indian Ocean.

RETICULATED.

17. GORGONIA *reticulum.* Branches very close, and cylindrical; rind red, and warty.

Indian Ocean.

UMBRELLA-SHAPED.

18. GORGONIA *umbraculum.* Fan-formed, almost reticulated; branches very close, cylindrical, and diverging; polypi warty.

Indian Ocean.

LATTICED.

19. GORGONIA *clathrus.* Reticulated; branches cylindrical; rind smooth.

MEALY.

20. GORGONIA *furfuracea.* Semi-reticulated, and inclining to fan-form; branches cylindrical; small side branches very short, some of them simple and others anastomosed; polypi numerous, dispersed,

and slightly projecting; opening small; axe brown; rind earthy; height from fifteen to twenty centimetres.

Coast of Bengal.

GRANULATED.

21. **Gorgonia** *granulata.* Almost reticulated; branches rather brittle than flexible, and frequently dichotomous; hardly any axe; rind stony, covered with small polypous tubercles; colour white; height from one to two decimetres.

Indian Ocean.

GRANIFEROUS.

22. **Gorgonia** *granifera.* Fan-formed, and nearly reticulated; net-work with irregular and lengthened meshes; branches cylindrical or compressed; cells almost globulous, truncated at the summit, with a round and regular opening; axe brown; rind thin, and whitish; height from four to five decimetres.

The Isle of France, or Mauritius.

M. RICHARD'S.

23. **Gorgonia** *Richardii.* Branches dispersed, or nearly lateral, and rather fan-formed; axe cylindrical, and of unequal thickness, sometimes compressed, of a consistence resembling that of the softest wood, and whitish; rind thin, friable, and of a light fawn colour, sown with polypiferous cells; the external polypi having eight tentacula, and forming a conical and projecting pustule of two millemetres: height six to eight decimetres.

The Antilles.

COMPACT.

24. GORGONIA *stricta*. Reticulated; meshes of the net-work rather lengthened, and irregular; branches compressed at the sides; polypi tuberculous, dispersed, and very compact; axe compressed, almost flat, and brown; rind thin, downy, and purple; height three decimetres.

PROJECTING.

25. GORGONIA *exserta*. Cylindrical, and branching; branches alternate; polypi projecting; rind scaly.

Seas of South America.

VIOLET.

26. GORGONIA *violacea*. Stem compressed, branching, and pinnated; polypi projecting, almost quadrangular; rind violet.

American seas.

TUBERCULAR.

27. GORGONIA *tuberculata*. Stem compressed, very thick, with a broad base; branches dispersed, and widely anastomosed; irregularly cylindrical, and almost fan-shaped; polypi placed in scattered tubercles, and rather numerous; the opening large, and very frequently obliterated by the body of the dried animal; rind thin, of a deep red fawn; axe brown, horny, and shining, formed in concentric layers; height from five to seven decimetres; diameter of some of the branches four or five centimetres.

Coast of Corsica.

FLAT.

28. **Gorgonia** *placomus.* Branching, rarely anastomosed; polypi projecting, conical, and upright.

Var. B. Branches almost compressed.

Mediterranean and Indian seas.

FORKED.

29. **Gorgonia** *furcata.* Branching, dichotomous, and cylindrical; branches diverging, variously curved, and nearly lateral; polypi tuberculous, dispersed, and discernible; axe brown, and cylindrical; rind whitish, and rather thin; height from fifteen to twenty centimetres.

Mediterranean.

AMARANTH.

30. **Gorgonia** *amaranthoïdes.* Branching, and almost fan-shaped; branches cylindrical, lateral, and thinly dispersed; tubercles numerous, obtuse, and dispersed; axe brown; rind whitish; height from fifteen to twenty centimetres.

WARTY.

31. **Gorgonia** *verrucosa.* Branches in two rows, and flexuous; polypi projecting.

Mediterranean, and other seas.

Note. Colour bright orange in a living state.

CITRON-COLOUR.

32. **Gorgonia** *citrina.* Stem branching; branches numerous, short, and almost cylindrical, rind either yellow, or a yellowish white, or greyish; polypi projecting, and rather scattered than regularly disposed; height about six centimetres.

America.

ROD-LIKE.

33. Gorgonia *virgulata.* Widely branching; branches not numerous, cylindrical, long, almost simple, and distant at their commencement; rind a red lilac or yellow; polypi rather projecting, and almost dispersed; height from three to four decimetres.

Carolina, in North America.

FURROWED.

34. Gorgonia *sulcifera.* Stem branching; branches lateral, dispersed, long, and marked with two opposite furrows, which reach to the extremities; polypi dispersed, and rather projecting; ciliated on the borders of the opening; axe whitish; rind orange; height from ten to twelve decimetres.

Indian Ocean.

HORNED.

35. Gorgonia *ceratophyta.* Branches long, channelled, and nearly dichotomous; polypi in two rows; rind red.

Mediterranean and other seas.

SUPPLE.

36. Gorgonia *viminalis.* Very long, branching, and slightly compressed; branches distant, scattered, long, and straight; polypi slightly projecting, and dispersed.

Mediterranean.

BERTOLONI'S.

37. Gorgonia *Bertolonii.* Cylindrical, and dichoto-

mous; branches long, very narrow, and bundled; rind rather warty, with simple and oblong cells.

Mediterranean.

TWIGGY.

38. Gorgonia *sarmentosa.* Branches loose, long, and flexible; axe bristly; rind cretaceous, and thickly covered with papillous or projecting polypi; colour, an orange yellow; height from four to five decimetres.

Found in the Mediterranean, and chiefly near the islands of Ivica and Formentera.

PUSTULOUS.

39. Gorgonia *pustulosa.* Branching; the principal branches, as well as the smaller ones, dispersed; polypi placed at the summit of conical and pustulous excrescences, which are divided in two almost lateral ranges by a small slightly projecting line; rind of a bright red; axe cylindrical; height from two to three decimetres.—Plate 15.

PURPLE.

40. Gorgonia *purpurea.* Almost dichotomous; branches slender; polypi warty.

American seas.

KNOTTED.

41. Gorgonia *nodulifera.* Branches marked with small alternate knots, a little distant, rounded, appearing spongy, and formed by polypous cells; rind an orange yellow; height from fifteen to sixteen centimetres.

PECTINATED.

42. Gorgonia *pectinata.* Branching; principal branches dispersed, and pectinated on the inside; smaller branches proceeding from only one side, simple, upright, parallel, long, and pointed; polypi tuberculous, and scattered; axe whitish; rind red, and not thick; height from five to eight decimetres.

Indian Ocean.

Nota. This species has been regarded, and with reason, as one of the most beautiful and remarkable of the Gorgonian Polypidoms.

I am inclined to believe it is to be met with in the Mediterranean, and also in the Red sea.

SECTION III.

Polypi very prominent on the whole of the Polypidom, or only on one part, always curved in the upper part and near the stem.

Stem simple, dichotomous, or with very few pinnated branches.

VERTICILLATED.

43. Gorgonia *verticillaris.* Branching, and pinnated; pinules alternate, stiff, either simple or slightly branching; papillous polypi, verticillated, ascending, and curved inwardly; height from six to seven decimetres.

Mediterranean.

FEATHER.

44. **GORGONIA** *penna.* Branching and dichotomous; branches expanded, and few in number; ramifications alternate, straight, parallel, approximate, and filiform; polypi alternate, recurved, and lateral; rind thin, and whitish; axe solid, and of a fawn colour; height about two decimetres; length of the ramifications from two to three centimetres.

Australasia.

ELONGATED.

45. **GORGONIA** *elongata.* Dichotomous; branches remote; polypi scattered, and almost imbricated.

Northern Sea and Atlantic Ocean.

RUSHY.

46. **GORGONIA** *juncea.* Very simple, very long, cylindrical, and attenuated at the extremity; polypi scattered and small; rind red or orange; height from ten to fifteen decimetres.

American Ocean, and the Isle Mauritius.

Nota. A fragment of this Gorgonia more than a metre high, and fixed to a piece of lava, was found and brought me from the Isle of France or Mauritius.

MOUSE-TAIL.

47. **GORGONIA** *myura.* Stem simple, filiform, bent, and whitish; polypi knob-formed, transversely wrinkled, curved towards the stem, and placed by double rows in an alternate disposition on the two opposite sides of the stem; height from fifteen to twenty centimetres.

NECKLACE-FORMED.

48. **Gorgonia** *moniliformis.* Simple, upright, and filiform; polypi tuberculous, sometimes alternate, and sometimes dispersed, with an umbilical opening; rind white, and very thin.

Australasia.

BRISTLY.

49. **Gorgonia** *setacea.* Simple and stiff; rind white and cretaceous, almost warty.

American seas.

SECTION IV.

Doubtful Polypidoms, which may not belong to the genus Gorgonia.

BRIAREAN.

50. **Gorgonia** *Briareus.* Slightly branching, cylindrical, and thick; rind nearly white internally, and ashy externally.

Seas of Southern America.

Nota. The polypi of this Gorgonia appear very large; it is in these that Ellis, in dissecting, thought he discovered nerves and muscles.

FLORID.

51. **Gorgonia** *florida.* Branching; branches scattered and reflected; rind reddish, and spongy; cells

pedicelled and urceolated at the summits of the branches.

Norway.

SCARLET.

52. GORGONIA *coccinia.* Branching; branches short, dispersed, and formed like Cladonias (some exotic lichens); axe horny; rind scarlet; height from three to five centimetres.

Australasia.

RED.

53. GORGONIA *coralloïdes.* Upright, and almost dichotomous; polypi projecting, and starry; rind red.

Mediterranean.

PLEXAURA.

TREE-FORMED Polypidom, branching, and frequently dichotomous; branches cylindrical and stiff; axe slightly compressed; rind in a state of desiccation corky or earthy, very thick, effervescing but slightly with acids, covered with numerous large and scattered cells, unequal in size, and which never project.

These Polypidoms differ from the two succeeding genera by the form of the polypean opening, always projecting in the Euniceas and Primnoas, but never in the Plexauras. It cannot be confounded with the

Gorgonias of the two last sections, whose polypi appear in small papillous risings or tubercles, nor with the first, whose very thin rind almost wholly dissolves in acids, whilst that of the Plexauras scarcely effervesces with them: in short, the nature of the fleshy envelope, its great thickness, the stiffness of the branches, their form, and the largeness of the polypi, which never project, and still more the existence of real cells, will always distinguish the Plexauras from others of the Gorgonian order.

In these Polypidoms is found a membrano-granulous substance, of the colour of violet, which appears to unite the rind with the axe, and adheres to these two parts, or sometimes to one alone, or first to one and then to the other; its thickness is not considerable; the internal part is slightly striated; the external surface is marked with numerous deep furrows, longitudinal and parallel. This membrane is in all probability of great importance during the existence of the animal; it is scarcely apparent in the Gorgonias; it visibly exists in the Isidias, and also in the Corallinas. It is perhaps destined to connect the myriads of animalcula which compose the swarms inhabiting the deep, and to effect a mutual communication between these singular beings, every individual of which seems to enjoy a peculiar life, whilst the mass is endued with a general existence independent of that of the individuals: or it may be destined to supply the increase of the interior, by adding new layers to the axe that sustains the fleshy envelope or rind; its adherence to both the envelope and the axe renders this hypothesis not improbable, particularly as the cells do not penetrate so deeply through the fleshy rind.

The rind of the Plexauras is probably irritable, and susceptible of contraction and dilatation, as the polypus can contract the borders of its habitation and wholly close it. In the species with large cells, such as the *Plexaura friabilis, heteropora,* &c. this cell always remains open; the polypus, instead of contracting its borders, shelters itself from the air and the contact of other bodies by horizontally extending a membrane, which forms the bag or peculiar envelope of its own body, but having an opening in the centre of this operculum or lid large enough to allow the water to penetrate to the bottom of its habitation.

The axe of the Plexauras is not so smooth as that of the Gorgonias; it is channelled, or rather wrinkled, and marked with points, which may be openings destined to maintain a communication between the interior of the axe and the exterior envelope.

These Polypidoms vary much in their form and size; many are dichotomous; some have their branches dispersed, and some almost pinnated; there are some whose height is five centimetres, and others reach two metres; in short, some are found of the thickness of a crow-quill, by the side of others whose branches are more than an inch in diameter; and yet the number of species is by no means considerable.

The Plexauras are not so brilliant in their colours as the Gorgonias; usually they are of a dull reddish fawn, of various shades, which sometimes turns to an olive colour.

They are found in the equatorial seas of both the New and the Old world, and also in the Mediterranean. From the magnitude of their cells and polypi, they are likely to be the first to attract the attention of naturalists travelling with a view to study the anatomy and physiology of the animal inhabiting the Coralline and flexible Polypidoms.

HETEROPOROUS.

1. **Plexaura** *heteropora.* But slightly branching, and dichotomous; cells distant, and dispersed; opening long, pointed at each extremity, but irregular, and bending in all directions; colour, a red fawn; height from three to five decimetres; diameter at least a centimetre and half.

Porto Rico and Antilles.

LARGE-CELLED.

2. **Plexaura** *macrocyttara.* Stem branching; branches almost dichotomous, covered with large unequal cells, and almost all touching one another; fawn colour; height from three to six decimetres. Habitation unknown.

THICK.

3. **Plexaura** *crassa.* Cylindrical, and dichotomous; branches thick, remote, and straight; cells dispersed; rind violet colour.

American seas.

FRIABLE.

4. **Plexaura** *friabilis.* Stem and branches dichotomous; cells round, of unequal size, and rather remote from each other; colour, a tarnished fawn; height from three to five decimetres.

Indian Ocean.

CORKY.

5. **Plexaura** *suberosa.* Dichotomous or branching; branches long and diffuse; cells radiated.

Indian seas, and Africa.

BENDING.

6. **Plexaura** *homomalla.* Branches numerous, dispersed, and often bowed down; cells dispersed; rind brown or reddish; height about three decimetres.

American seas.

OLIVE-COLOURED.

7. **Plexaura** *olivacea.* Very branching; branches scattered, and rather pinnated; rind olive-colour; cells dispersed, and thinly sown; size about one decimetre.—Plate 16.

East Indies.

EUNICEA.

A tree-formed, branching Polypidom; axe almost always compressed, particularly at the juncture of the branches; covered with a thick cylindrical rind, and strewn with projecting papillæ, which are always scattered and polypous.

In this genus the polypi are always placed in papillous cells, often several millimetres in length and breadth, sometimes rather smaller, and always remarkable for their form: this character is peculiar; for although some of the Gorgonias equally present polypous projecting cells, they are in those Polypidoms always reflected towards the stem and branches, and frequently the lower branches have only simple tubercles, or else their surface is completely smooth; whilst in the Euniceas the papillous cells are always straight, and of the same length through the whole extent of the Polypidom; moreover, their substance, as well as their appearance, differ so materially, that it is impossible to mistake the Gorgonia for the Eunicea.

The rind of these Polypidoms appears organised like that of the Plexauras; it resembles their envelope in its thickness, its consistence, and the very apparent intermediate membrane between the axe and the fleshy exterior, as well as in the colour. As far, however, as we can form any judgment from beings no longer in existence, a long time dried, and frequently defaced, the polypi seem to be different. It appears as if, their body being less retractile, the deficiency were supplied by tentacula of greater length than those belonging to the Gorgonia; and it seems as if the animal itself must be of considerable extent to fill up that cavity in the rind which we have always imagined to be a cell; none of the Gorgonias exhibit such an extent. The tentacula of the polypi belonging to the Euniceas, of a cylindrical form and pointed in the state of desiccation, seem to be numerous, and wrap over each other apparently without regularity, but cannot wholly enter the interior of the cell.

The Euniceas vary little in their form; they are generally branchy ; and their branches are dispersed and cylindrical. In the papillous risings, however, there is a considerable difference ; for some of them are short, and some in the form of pyramids pressed down, whilst others are seen of great length and with a rounded summit ; sometimes they have a smooth surface, and at other times it is prickly.

Their colour is the same as that of the Plexauras, which is a reddish-brown fawn, of a fainter or deeper hue ; it varies less than in the Gorgonias, and becomes white by exposure to light and air, and the more rapidly in proportion as the tentacula of the polypi are more extended.

These Polypidoms are found in that part of the ocean situated between the Tropics, extending but little into the temperate seas ; they are not scarce, and are to be met with in most of the collections.

ANTIPATHIAN.

1. EUNICEA *antipathes.* Polypi very large, on a thick brown rind; the axe compressed, and almost flat in the branches.

Mediterranean and Indian seas.

PAPILLOUS.

2. EUNICEA *microthela.* Branching, and almost pinnated ; branches curved ; papillæ conical, and but slightly projecting ; rind friable and cretaceous ; colour, greenish fawn ; height from six to eight centimetres.

FILE-FORMED.

3. EUNICEA *limiformis.* Branching or dichotomous ; papillæ conical, and from one to two millimetres long ;

rind thick and corky, of a reddish brown approaching to black; axe compressed at the articulations; height from two to three decimetres.

American seas.

SOFT.

4. **Eunicea** *mollis.* Cylindrical and dichotomous; branches flexuous and intermixed; rind spongy and blackish; height from three to four decimetres.

Mediterranean.

AMBER.

5. **Eunicea** *succinea.* Branches dichotomous; papillæ prominent and very open; axe transparent, and of a colour resembling yellow amber.

Nota. The three preceding species have so much resemblance to each other, that they may be merely varieties of the same species.

PSEUDO-ANTIPATHES.

6. **Eunicea** *pseudo-antipathes.* Branching and dichotomous; papillæ broad at the base, and truncated at the summit; rind very thick, not adhering strongly to the axe, which is always compressed at the bifurcations; height from two to three decimetres.

American seas.

CLUBBED.

7. **Eunicea** *clavaria.* Branches cylindrical, in the form of clubs, and very few; papillæ with a large opening, but varying in their length; rind blackish; axe diminishing greatly by desiccation, and appearing compressed; height two decimetres; diameter of the

branches in their thickest part from two centimetres to two and a half.

The Antilles.

MAMMIFORM.

8. **EUNICEA** *mammosa.* Branching; nearly dichotomous; papillous projections cylindrical, from two to five millimetres in length, the opening almost lobed; Carmelite colour; height two decimetres.—Plate 17.

CALIX-FORMED.

9. **EUNICEA** *calyculata.* Dichotomous; branches thick and upright; projections large, and formed like a calix.

PRICKLY.

10. **EUNICEA** *muricata.* Dichotomous or branching; papillæ cylindrical, from two to three millimetres in length, dispersed, upright, and in a manner imbricated.

American seas.

RUSH-LIKE.

11. **EUNICEA** *scirpea.* Base with a foliated or leafy appearance; stem very simple and upright.

Indian seas.

Nota. We are informed by Pallas, (one of the philosophers of the last century, who, though not emancipated from the prejudices that had preceded his age, yet by his observations and labours contributed greatly to the advancement of knowledge), that this last species of Eunicea is remarkable for the form of its base, composed of numerous, thin, leaf-shaped membranes, torn, striated, and of a curly appearance when desiccated.

PRIMNOA.

A tree-formed, dichotomous Polypidom; papillous projections long and pyriform, or conical, pendent, imbricated, and covered with scales equally imbricated.

One only species of Polypidom forms the genus Primnoa, which all authors have agreed in uniting to this Gorgonian order, but whose characteristic peculiarities are too striking to confound it with others of the same order.

Many naturalists have mentioned the Primnoa Lepadifera, but have never noticed the polypi of this singular production, and all of them have taken the long pyriform and pendent bodies covered with imbricated scales for polypean cells; my observations have induced me to consider them as the polypi themselves, and not their habitation. The tentacula appear to me to be conical, and, in a state of repose, seem to close the opening that communicates with the interior cavity, which is large, and without doubt destined to contain the organs of most importance to the existence of the animal. The external part of the papilla *(mamelon)* is covered with scales of the same nature, and of a form resembling that of the tentacula.

The Primnoas, placed at the latter part of the order of Gorgonias, ought perhaps to conclude the genera of rind-formed or corticiferous Polypidoms, from the peculiar character of their polypi. These little animals,—which in the Spongias are confounded with the gelatinous substance that envelopes them, which in the Antipathes are but just discernible, which in the Gorgonias are decidedly apparent, and still more evident in the Plexauras, which in the Euniceas rise above the rind,—appear as if they would insulate, and detach themselves from each other, in the Primnoas ; thus commencing the order of radiated and unconfined animals. Still, however, the essential character of the Gorgonian order exists in full force, and we find in the Primnoas the two very distinct substances of the axe and rind. The first appears calcareous and stony in the stem and larger branches; its hardness diminishes in proportion as the branches become smaller; and in the smallest it is nearly horny. The rind, not so thick as in the Euniceas or Plexauras, still presents an organisation analogous to that of those Polypidoms. All these circumstances unite the Primnoa to the Gorgonian order.

Their colour is an earthy white, with a tinge of yellow.

Their height seldom exceeds three decimetres.

The P. *Lepadifera,* described in the above account of the characters of the genus, is found in the North seas, particularly on the coast of Norway.

CORALLIUM.

A TREE-LIKE, inarticulated Polypidom ; axe stony, stiff, and susceptible of a beautiful polish ; rind fleshy, becoming chalky and very friable by desiccation, and adhering to the axe.

The Coral is a Polypidom resembling a small tree deprived of its leaves and twigs, having nothing left but the trunk and branches ; it is fixed to rocks by a large base, from which it rises to the height of three decimetres.

It is composed of a calcareous axe, and of a gelatino-cretaceous rind : the axe is equal to marble in hardness ; it is formed by concentric layers, which become perceptible by calcination ; its surface is more or less striated, the striæ are parallel, and unequal in depth.

A reticulated body, formed of small membranes, with numberless vessels and glands filled with a milky juice, appears to unite the rind with the axe ; this reticulated body is found in all corticiferous Polypidoms : the rind is of a less deep colour, of a soft substance, and formed of small membranes and slender filaments ; it is pierced by tubes or vessels, and covered with tubercles which are thinly scattered and have a large base, the summit of which is terminated by an opening divided into eight parts. In the interior is found a cavity which contains a white and almost transparent polypus. Its mouth is surrounded by eight conical tentacula, slightly compressed, and ciliated on their borders.

Coral is found in different parts of the Mediterranean and in the Red Sea: it grows in all directions, and each trunk forms a perpendicular to the level from whence it springs.

Coral attaches itself to all hard rocks, whatever may be their nature; it is also found on unfixed bodies, such as fragments of lava, of stone vases, or broken glass, and it is even seen, in the cabinets of naturalists, adhering to human skulls.

When the Coral is once detached, and at the mercy of the waves, it soon loses its polypiferous rind; to enable the constructors of this brilliant edifice to labor for its increase, it is necessary that it should be fixed. Their work does not advance with a rapidity equal to that of the madreporic polypi in the Indian sea, or the immense Eastern Ocean, whose labors, in the short space of a few years, close the entrance of ports, and raise immense reefs, on which many vessels, sailing in those distant regions, strike and perish. Eight or ten years, at a moderate depth, are requisite for the Coralline Polypi to raise their habitation to the height of two or three decimetres, an extent it never surpasses, whatever may be the age of the Polypidom. Arrived at this degree of growth, it widens, though very slowly, and soon, pierced on all sides by those destructive worms which even attack the hardest rocks, it loses its solidity, and the slightest shock detaches it from its base: becoming then the sport of the waves, the polypi perish, and leave exposed its brilliant stem, which, cast upon the shore, loses its bright hue, or, by its incessant attrition with harder bodies, is reduced to powder.

Coral is found at different depths in the heart of the waters, but, notwithstanding the density of the medium in which it exists, all aspects are not suitable to it. On the coasts of France it covers those rocks that face the south; it is rarely found on those having an eastern or western aspect, and never on those having a northern one. It is never met with at less than three metres below the surface, nor ever at a greater depth than three hundred metres.

In the straits of Messina it prefers an eastern aspect; on the south it is seldom found, and still less on the rocks of the north or west. They there fish it from a depth of one hundred to two hundred metres. In those straits, which Homer and Virgil have immortalised, the solar rays strike more perpendicularly than on the coast of France, their heat penetrates to a greater distance, and the Coral is found even deeper than three hundred metres; but then its quality no longer compensates for the risks and numerous difficulties which attend the procuring it.

On the north coast of Africa it is not sought beyond thirty or forty metres in depth, and at a distance of three or four leagues from shore; they abandon it when it reaches two hundred and fifty or three hundred metres.

The influence of light appears to operate powerfully on the growth of Coral. A foot of this animal production, to acquire a determinate height, requires eight years in water of the depth of from three to ten fathoms; ten years, if the water is from ten to fifteen fathoms in depth; from twenty-five to thirty years, at the distance of a hundred fathoms from the surface; and forty years at least, at the distance of one hundred and fifty.

The Coral is generally of a more beautiful colour in shallow waters, which easily admit the light, than where the immense column of water, by absorbing all the luminous rays, deprives it of the energetic influence exerted over all animated beings by that beneficent fluid which unceasingly emanates from the sun.

The Coral on the coast of France, perhaps better chosen than in other countries, has the reputation of having the liveliest colour, and possessing the greatest brilliancy; that of Italy, however, rivals it in beauty: on the coasts of Barbary it attains greater thickness, but the colour is not so lively, nor so brilliant.

Fifteen different varieties are distinguished in the course of commerce, which, from their colour and degrees of beauty, obtain the several names of *froth of blood; flower of blood; first, second, third blood, &c.*

N. B. The manner of obtaining Coral is so well described in a short account of Trepani in Sicily, that, as M. Lamouroux refers us to other books for information on the subject, I shall take the liberty of inserting it.

"At this place is carried on the principal Coral fishery of the island, which is managed by a very ingenious and simple contrivance. To the centre of a large cross of wood is fixed a stone sufficiently ponderous to carry the cross to the bottom of the water. Pieces of small net are tied to each limb of the cross, which is poised horizontally by a rope, and then let down into the sea. As soon as they feel it touch the bottom, the rope is tied fast to the boat. They then row about over the beds of coral, and the great stone breaks the branches of the rocks, which are immediately entangled in the nets."

RED.

1. **Corallium** *rubrum.* Branches rambling, and cylindrical.

Mediterranean; Red Sea; and warmer climates.

CLASS III.—ORDER III.

GENERA AND SPECIES.

Tree-like Polypidoms, formed of a rind analogous to that of the Gorgonias, but with an articulated axe; the articulations are alternately horny or corky, and calcareously stony.

MELITEA.

A tree-like, knotty Polypidom, with branches almost always anastomosed; articulations stony, and substriated; between the knots spongy and swelled; rind cretaceous, very thin, and friable on desiccation; polypi on the outside, or in tubercles.

It has been generally observed in this genus, that a horny articulation is constantly united to a stony, hard, and compact one; should the former be spongy, the latter is then found porous and not solid. In the first case, the horny articulation is easily distinguished from the stony, and it is always smaller; but in the second, the name of stony articulation is no longer applicable; it is no more than a spongy knot, larger than the stony articulation, and often so confounded with it, that it becomes difficult to distinguish the limits that separate them. This character has induced me to place the Melitea immediately after the Coral; for it appears as if Nature in these Polypidoms was beginning a new order, in forming an axe, or articulated skeleton, instead of the stiff continued one of the Gorgonias.

The cells, or rather the polypi of the Melitea, vary in their form and situation; they are either superficial or tuberculous, either dispersed or only on the sides; there are some whose border and interior, of a carmine red, blend most agreeably with the lively and brilliant citron colour of the rind.

The colour is pretty uniform in all the Meliteas; it is a red passing through all the shades from the lightest rose to the deepest purple, and which sometimes changes to a more or less brilliant yellow. The polypi are red when the Meliteas have a yellow rind, and yellow when the rind is red. Most of them originate in the equatorial seas.

OCHREOUS.

1. MELITEA *ochracea.* Horny articulations, projecting and spongy; the stony ones unequal in length, smooth in the small branches, furrowed in the greater.

Indian seas.

RISSO'S.

2. MELITEA *Rissoi.* Branches diverging, and ana-

stomosed together; cells surrounded by a projecting roll.

Indian Ocean.

NET-FORMED.

3. Melitea *retifera.* Branching, and almost dichotomous; branches flexuous, and frequently anastomosed; articulations either remote or deficient in the twigs, very apparent in the branches, and approximate in the stems; height from two to six decimetres.

This species is remarkable for the number of its varieties.

Var. B. Red; very large.

Var. C. Purple; articulations knotty, and appearing as if truncated.

Var. D. Spotted; rind yellow, and polypi red.

Australasia and India.

WEB-FORMED.

4. Melitea *textiformis.* Stem short, knotty, dividing immediately into very slender twigs, filiform, warty, anastomosed, and producing a fan-shaped network, simple or lobed, with lengthened meshes; colour varying from white or yellow to orange and red; height from two to three decimetres.—Plate 19. fig. 1.

Australasia.

MOPSEA.

A tree-formed Polypidom, with pinnated branches; rind thin, adherent, covered with very small papillæ, *(mamelons,)* which are elongated, curved towards the stem, dispersed, or subverticillated.

The articulations of the axe are alternately horny and stony; the first, of a deep brown colour, are very thick in the stems, sometimes even more so than the second: this thickness diminishes in the branches, and in the twigs it becomes invisible to the naked eye, being only rendered perceptible by friction. The stony articulations are of a fawn colour, or a dull white, in general thicker and always larger than the first, and of sufficient hardness to receive a fine polish: their surface is finely striated, and the striæ, which are parallel and longitudinal, sometimes extend to the horny articulations.

The rind, thin and adherent, appears devoid of polypi in the stem and principal branches; but the minor branches and their divisions are covered with polypous papillæ, which are dispersed or almost verticillated, elongated, straight at their commencement, with the extremity recurved interiorly; their substance is the same as that of the rind; the form of these papillous protuberances, as well as of the branches, which sometimes divide themselves in pairs, sometimes in side twigs, or else are pinnated, gives these Polypidoms some resemblance to the verticillated Gorgonia and its connexions.

Their colour is a brilliant fawn, sometimes a red purple, or scarlet.

Their height varies from one to four decimetres. They originate in the Indian and Australasian seas.

VERTICILLATED.

1. MOPSEA *verticillata*. Branches pinnated; twigs simple, and long; polypi recurved like a hook.—Plate 18. fig. 2.

Australasia.

DICHOTOMOUS.

2. MOPSEA *dichotoma*. Branches slender, cylindrical, almost filiform, and dichotomous at each articulation; polypi mammiform in the higher branches, tuberculous in the middle ones, and superficial in the lower; rind smooth upon the stem.

Indian Ocean.

ISIS.

A TREE-FORMED Polypidom; rind very thick, friable, not adhering to the axe, from which it easily detaches; cells dispersed and superficial.

The Isideas, like all the corticiferous Polypidoms, are composed of two parts, one central, called the axe, and an envelope of a fleshy consistency, called the rind, as in the Gorgonias. In this genus, however, the articulations which mark the order are alternately stony and horny, varying in their height and their diameter: the first are white, slightly translucent, marked with longitudinal furrows of greater or less depth, sometimes larger and frequently smaller than the second or horny articulations; these last are always opaque, of a deep brown colour, and easily distinguished from the preceding by the great difference which exists in their composition. They appear destined to give to the Isideas, or genera of the present order, the power of yielding to the movements of the waters, and thus, by a slight flexibility, to make up for their want of solidity: this flexibility ceases when the Polypidoms are dry, then indeed their fragility is such that it is impossible to bend them so as to preserve them in a herbal. In general, the Isideas are more fragile in proportion to the difference that exists between the two substances that compose the axe.

The rind, or external envelope, is of a soft and fleshy consistency in the living Polypidom; by desiccation it becomes cretaceous and friable, not adhering to the axe, from which it separates with so much facility, that some authors have imagined it was never entire. It is very rarely so found in the collections, but in its natural state the case is different; then the stem and the branches of this articulated Polypidom are covered through their whole extent with a fleshy envelope, animated with swarms of small and brilliant polypi. This envelope or rind is always very thick, both when taken from the sea, and after desiccation.

It may not be useless to remark in the Isidean order a circumstance equally observable in that of the Gorgonias, which is, that where the rind is thin it always adheres to the axe, and separates from it with proportionate facility as the rind increases in thickness. Thus the Isideas and the Plexauras, the Gorgonias and the Meliteas, exhibit a striking analogy in the two-fold circumstance of the thickness of the rind and its adherence to the axe.

These Polypidoms vary but little in their form, being always cylindrical, with branches dispersed.

Neither in colour do they differ materially; they are whitish when the Polypidom is clothed with the rind; but in the axe two very distinct shades are observable; the calcareous articulations having a whiteness rembling rock-salt or marble, from its semitransparent purity; whilst in the horny divisions the colour is sometimes brown of various hues, sometimes yellowish, and sometimes almost black.

Their height varies from one to five decimetres.

These Polypidoms, inhabiting all seas, are found on the coasts of Iceland, as well as those of the equatorial regions; there are but few species known, but the greater part are said to originate in the Indian Ocean.

HORSE-TAIL.

1. Isis *hippuris.* Stony articulations, irregular, striated longitudinally, those at the extremities compressed, sometimes almost flat.

In all seas.

ELONGATED.

2. Isis *elongata.* Branches very few, and those frequently anastomosed; stony articulations, long, cylindrical, deeply striated, and larger than the horny articulations; height six decimetres.

Indian Ocean.

Nota. In this species, and the preceding, the stony articulations of the twigs are longer than those of the branches.

SLENDER.

3. Isis *gracilis*. Base laciniated; stem and branches cylindrical, the latter few in number; stony articulations of the stem sometimes near each other, sometimes distant, those of the branches very long; both kinds translucent, sleek, white, and larger than the horny; the rind unknown; height two decimetres.—Plate 18. fig. 1.

Antilles.

ADEONA.

Stem articulated like the axe of the preceding Isideas, surmounted by a fan-shaped expansion, that is strewed on both surfaces with very small scattered cells, and pierced with round or oval oscules.

The organisation of the stem of the Adeonas being exactly similar to the axe of the Isideas, has induced me to place them under the same order, though some peculiarities of character might seem to exclude them from that division. And here it may be proper to observe, that this genus appears in the most natural manner to unite the Coralline and flexible Polypidoms with those Polypidoms that are wholly stony: in fact, we can only compare it to a Millepore, fixed to the axe of a Mopsea or an Isis. And although in the preserved specimens brought to Europe no rind has been discerned, yet it is by no means certain that when fresh, and in a living state, they do not possess a rind. Supposing that these beings do not change by desiccation, we must admit that Australasia, in these Polypidoms, offers us a new example of organised beings which have no place in our classifications, a circumstance not rare in that fifth division of the world. The difference between the fan-formed expansion and the stem is so great, that naturalists at first sight were tempted to look upon these two parts as distinct beings; it is however easy to prove that they belong to the same animal. Peron, who had seen them in the very site of their growth, told me he had frequently convinced himself that they were one and the same Polypidom. If the base of the fan-formed expansion of the Adeonas be attentively observed, it may be seen to extend itself into the stem, and only by degrees to change its nature: when that change is completed in the stony articulations, we find this same stony substance forming the expansion, which differs only from the articulations in possessing cells that are not found in the stem. These circumstances are sufficient to prove that the stem and the expansion of the Adeonas, notwithstanding the disparity of their form, cannot be the productions of different animals.

The stem of this Polypidom is irregularly cylindrical, sometimes branching, and composed of calcareous articulations without pores or cells, as hard as coral, and separated from each other by disks or plates of a horny, fibrous, and flexible substance. The expansion, as has been already observed, is stiff and brittle; its hardness is equal to that of many of the Madrepores, and superior to that of most of the Millepores: the pores or cells are very numerous, placed in short curved lines, or dispersed on both surfaces; all those that are found on the same side, appear to communicate with each other by very thin perforated divisions. The polypi of the two surfaces appear insulated by means of a diaphragm, which is very thick, and parallel to the plane of the two surfaces, dividing the Polypidom in two laminæ of equal thickness.

The colour of the Adeonas is an iron-grey, sometimes of a deep hue.

They rise to two or three decimetres in height.

GREY.

1. ADEONA *grisea.* Stem short; expansion almost orbicular or fan-formed, and pierced with oscules; colour a deep iron-grey; height about one decimetre.—Plate 19. fig. 2.

Australasia.

ELONGATED.

2. ADEONA *elongata.* Stem long and tortuous, sometimes branching; expansion long, and nearly oval; oscules inclining to oval; colour whitish; height two decimetres.

Australasia.

FOLIACEOUS.

3. ADEONA *foliacea.* Stem long and branching, cylindrical, with foliated expansions, which are almost linear, dispersed, or placed in clusters; height from two to three decimetres.

Australasia.

CLASS IV.

GENERA AND SPECIES.

POLYPIDOMS of various shapes, formed of a fleshy and animated mass, sometimes inert, sometimes susceptible, and filled with retractile polypi, which expand like blossoms upon its surface. In a state of desiccation this mass appears composed of interwoven fibres, reticulated at the centre, radiating to the circumference, and enclosed in a firm cellular exterior, leathery and cretaceous. The number of tentacula varies in the different species.

Alcyonium; of various shapes, with a smooth surface, or slightly tuberculous.

Palythoa; with numerous papillæ, each one inclosing a polypus.

ALCYONIUM.

Polypidoms of various shapes, having the appearance of a thick, porous, or cellular mass, spread out or ramified, sometimes lobed, and at others in the form of a crust; the interior substance spongy or corky, surrounded by a radiated, tubulous tegument, and enclosed in a hard leathery rind.

The cells of this Polypidom are round, and unequal in their diameters, from four to five millemetres in depth, separated from each other by thin partitions, which are rendered opaque by a vast quantity of solid globules, that appear to form the least animated part of the zoophyte. These cells enclose a polypus, externally composed of a transparent sack or membrane; which is fortified by eight filiform longitudinal fibrous bands, placed at equal distances, and difficult to be perceived owing to the presence of numerous transverse and parallel fibres. The longitudinal fibres seem attached to the borders of the cells, and to the roots of the tentacula. The sack (which is capable of extending and contracting, the upper part falling back when the little animal retires within its transparent covering) encloses the body of the polypus, having in the centre a hemispheric mass, divided into eight equal parts by vertical partitions, whose summits present a round or lozenge-shaped opening, at the will of the animal. I take it to be the mouth; the borders are furnished with irritable appendages, the form of which I have not been able to ascertain.

Around the half-globular mass is a projecting membrane, on which are found eight perforated tubercles, and at the base of these is seen a furrow of greater or less depth, extending almost to the extremities of the tentacula. These eight organs are placed round the polypus; their form is flat above, round below, obtuse at the summit, and larger at the base than at the extremity; the lower surfaces and sides are even; the upper, marked with the furrow already noticed, is covered with small moveable papillæ; those of the centre appear different from those observed on the borders. These tentacula fold over each other, and surround the globular mass, which then forms a spherical or pyramidal body.

All this upper part of the animal is fixed to a much smaller body, of a cylindrical form; at its extremity are eight long pointed cuts or scallops, which adjoin to the eight bands of the sack, or general envelope, and are terminated by eight small bodies in the form of intestines, the extremities of which appear to float freely in the fluid that fills the sack.

The interval between the long cylindrical body of the polypus, and the membrane which encloses it, appears much less transparent than that which exists in the part where the intestines float.

The general envelope of the polypus sometimes rises a centimetre above the surface of the Polypidom, and all the parts it encloses are easily observed by the aid of a good lens.

The semi-globular mass in the centre of the polypus may be looked upon as a collection of stomachs, separated by vertical partitions, or one stomach with eight divisions, having one mouth in common, surrounded by moveable appendages. But what may be the use of those tubercles on the projecting membrane found at the base, and surrounding the hemispheric mass, remains yet to be discovered.

It is necessary to observe that the tentacula, the tubercles, the divisions of the hemispheric body, the intestines and the bands, always correspond in number.

After this description, imperfect as it undoubtedly is, it will be easy to conceive how complicated is the organisation of the Alcyonian polypi; many points of resemblance seem to unite them to the animals of the harder Polypidoms.

These Polypidoms vary much in size; some of them extend in patches of greater or less thickness on the surface of the bodies to which they adhere, whilst others raise their branches more than two metres high.

Some live on marine plants; others delight more in miry waters, and raise above the surface their animated tubercles; the greater number attach themselves to rocks and the larger shells, which they sometimes wholly cover with their polypean mass.

They are found in all seas and at all depths; nevertheless, in consequence of the difficulty attending researches into the nature of these beings, the number of species known is as yet very inconsiderable,

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ARBORESCENT.

1. Alcyonium *arboreum*. Stem tree-formed; ex-

tremities of the branches obtuse; cells placed on large tubercles.

Sea of Norway, Mediterranean, and Indian Ocean.

Nota. Most authors have mentioned this Polypidom as originating on the coasts of Norway; Kœlreuter found it in the Mediterranean, and Pallas says he has seen them in the Indian Ocean; but the difference in the temperature of these seas is such as to incline me to think the authors here mentioned may have mistaken the identity of the species, and that probably the *A. Arboreum* of the north may differ from that of the Mediterranean, or that of the Indian seas; although, as the temperature is more nearly alike in the last-mentioned seas, there may be a stronger resemblance in their Polypidoms.

PALMATED.

2. ALCYONIUM *palmatum.* Stem flattened, and reddish; terminated above by lobes resembling fingers, and strewn with starry pores.

Mediterranean.

LOBED.

3. ALCYONIUM *lobatum.* A tube-formed mass, drawn in at the base, and terminated by finger-shaped lobes, whose number varies.—Plate 13.

European Ocean.

Nota. The colour of this Polypidom varies from a white, lightly tinged with rose, to the deepest orange, beautifully contrasted by the white polypus, whose colour never changes.

RED.

4. ALCYONIUM *rubrum.* Thin patches of a red colour, wholly covered with dispersed points or cells with eight rays.

Sea of Norway.

SEA-QUINCE.

5. ALCYONIUM *cydonium.* Mass oval or elliptic, convex above, and flattened below; laciniated or irregularly creviced; little cells apparent when the exterior has not been rubbed off.

Seas of the North, of Africa and of India.

LUMPY.

6. ALCYONIUM *massa.* Shapeless, fawn-coloured, spongy, and spread out; little cells with five rays; centre black.

Sea of Norway.

TURBAN.

7. ALCYONIUM *cidaris.* Of a nearly round form; surface firm, hard, cellular, undulated, and sometimes osculated.

Mediterranean.

HIVE-FORMED.

8. ALCYONIUM *vesparium.* A large, upright mass, of an oblong oval shape, slightly pyramidal, obtuse or truncated at the summit; from five to eight decimetres in height.

Seas of India.

INCRUSTING.

9. ALCYONIUM *incrustans.* Masses incrusting, obtuse, proliferous, or lobed, and very white; pores numerous, close together, and somewhat in the form of a star.

On the fucus of the European seas.

CLIMBING.

10. ALCYONIUM *serpens.* Fleshy and whitish

bands or fillets, which climb or twine on the Spongia Deltoïdea and Loricaris; warty protuberances, rising very little, pierced at the centre by an oscule frequently plaited in rays.

Seas of America.

TRIANGULAR.

11. Alcyonium *trigonum.* A fleshy mass, rather thick, compact in a dry state, trigonal, whitish, and porous both on the inside and outside.

PERFORATED.

12. Alcyonium *foratum.* Oblong, and nearly cylindrical; surface almost reticulated; oscules large, and dispersed; substance spongy, firm, and not flexible.

SIEVE-LIKE.

13. Alcyonium *cribrarium.* In large envelopes, whitish, and bored with non-projecting oscules, which are terminated by tubulous cells.

PHALLIC.

14. Alcyonium *phalloïdes.* Pedicle short and thick, supporting wide branches, which are tortuous, lobed, and collected in dense packets; oscules small, and dispersed.

Oriental seas.

PYRAMIDAL.

15. Alcyonium *pyramidale.* Of a conical or cylindrical form; interior substance fleshy and red.

Mediterranean.

LOBED.

16. Alcyonium *pulmonaria*. Mass round, and lobed; interior substance pulpy; colour inclining to olive.

Seas of Europe.

ORANGE OF THE SEA.

17. Alcyonium *lyncurium*. Globular in form; surface tuberculous and yellowish; interior susbtance fibrous.

Northern seas, Mediterranean, and Cape of Good Hope.

PITHY.

18. Alcyonium *alburnum*. Stem white, and branching; extremities of the branches attenuated, and tubulous.

Indian Ocean.

PLAITED.

19. Alcyonium *plicatum*. Flat and large, garnished above with thick, tortuous, undulated and plaited laminæ; the upper border round; oscules or pores very small, and dispersed; width twenty-five centimetres at least.

Var. B. Misshapen; laminæ irregularly raised and plaited.

Australasia.

SINUOUS.

20. Alcyonium *sinuosum*. The upper part of the mass divided into upright laminæ, which are short, thick, tortuous, sinuous, and osculated in their terminating border.

DEVIL'S HAND.

21. Alcyonium *manus diaboli.* A very shapeless mass, irregularly lobed, subangular; lobes coalescent, obtuse, cylindrical or compressed; varying in their length.

Northern sea.

DIFFUSE.

22. Alcyonium *diffusum.* Branches numerous, long, diffuse, almost compressed, irregular, and coalescent; oscules dispersed; height from twenty-eight to thirty centimetres.

SCEPTRE-SHAPED.

23. Alcyonium *sceptrum.* Long, cylindrical, and in the form of a club; oscules numerous, dispersed, or in heaps; fibres very fine, and incrusted; colour whitish; height twenty-five centimetres.

SWORD-SHAPED.

24. Alcyonium *ensiferum.* Upright and branching; branches long, almost compressed, curved like a scimitar, simple or proliferous, porous, and osculated; colour whitish; height forty-five centimetres.

Australasia.

JUNCOUS.

25. Alcyonium *junceum.* Tuft of whitish shoots, which are long, slender, branching, dilated or com-

pressed, frequently cylindrical, obtuse at the summit, and osculated; oscules dispersed, or in marginal series; height twenty-nine or thirty centimetres.

Coast of Madagascar.

Nota. Some doubts exist whether this may not be a Spongia.

OAK-LEAVED.

26. ALCYONIUM *quercinum.* Stem short, stiff, firm, full, and rather tortuous, ramified, dilating in flat expansions, foliaceous, incised, laciniated, slightly lobed, having some resemblance to the leaves of the oak, and sometimes enveloping fuci; height fifteen centimetres.

Australasia.

ASBESTINE.

27. ALCYONIUM *asbestinum.* Stem nearly cylindrical, and reddish, strewn with oblong pores, disposed in fives.

American seas.

SKULL-FORMED.

28. ALCYONIUM *cranium.* Tubulous, white, and covered with hairs.

Sea of Norway.

PAPILLIFEROUS.

29. ALCYONIUM *papilliferum.* Sessile and spread out; surface covered with short smooth papillæ, more or less projecting, and osculated; the space between the papillæ reticulated, and stuck with small thorn like tubercles; colour reddish fawn

or greyish; height from seven to twelve centimetres.

Indian Ocean.

TUBEROUS.

30. **Alcyonium** *tuberosum.* Yellowish and tuberous; summits frequently a little divided; cells tubulous and approximate.

Coasts of the Island of Mauritius.

FIG-SHAPED.

31. **Alcyonium** *ficus.* Mass in the form of a fig or pear; almost oval, pulpy, livid, perforated at the summit, and presenting from one to three oscules.

Mediterranean.

CYLINDRICAL.

32. **Alcyonium** *cylindricum.* A solid cylindrical mass, of the thickness of a finger, with oscules placed on a side range, and common to several cells.

ROOT-FORMED.

33. **Alcyonium** *radicatum.* Cells very small, and dispersed; base with many clefts.

Southern Africa.

GELATINOUS.

[illegible]

34. **Alcyonium** *gelatinosum.* Of various shapes, greenish and pediculated; pedicle cylindrical, of the thickness of a crow-quill, and with a base; polypi transparent, with a funnel-shaped body, having a marginated border, armed with twelve equal, long, and filiform tentacula.

European Ocean.

PAPILLOUS.

35. **Alcyonium** *papillosum.* In a raised mass, thickly covered with large convex tubercles.

Mediterranean.

TWO-MOUTHED.

36. **Alcyonium** *distomum.* In thin patches sown with red tubercles, pierced with two openings.

On the stems of the large fuci in the European seas.

GORGONIAN.

37. **Alcyonium** *Gorgonioïdes.* In small enveloping patches; cells tuberculous, with a star-formed opening.

Coast of Curaçoa.

CORNICULATE.

38 **Alcyonium** *corniculatum.* Four star-formed oscules, surrounding a central tubercle, and terminated by four upright appendages.

Coast of Belgium.

STELLATE.

39. **Alcyonium** *stellatum.* Two terminating star-formed oscules.

Coast of Belgium.

FLUVIATIC.

40. **Alcyonium** *fluviatile.* In shapeless spreading patches, covered with pentagonal pores set close to each other.

In the running and still waters in the environs of Paris, particularly at the fountain of Bagnolet.

COMPACT.

41. **Alcyonium** *compactum.* A globulous and rather irregular mass, perhaps detached; surface sleek; flesh firm and corky in a dry state.

Var. B. Lower part almost pointed.

Atlantic Ocean.

Nota. This last species commences the second section of M. Lamarck's Alcyonias, which are distinguished from the first by the non-apparent oscules of the cells on the dry Polypidom; it includes the Alcyonium *compactum, medullare, paniceum, testudinarium, orbiculatum, radiatum, cuspidiferum, granulosum, putridosum, purpureum, boletus, boletiforme, gelatinosum,* and *bursa.* The last of these I have placed among the Thalassiophytes, under the name of *Spongodium bursa;* the Alcyonium *gelatinosum* evidently belongs to the genus; all the others are doubtful, and perhaps form an intermediate group between the Alcyonias and the Spongias.

MARROW OF THE SEA.

42. **Alcyonium** *medullare.*

43. **Alcyonium** *paniceum.* See the description of Spongia *panicea,* (p. 157).

TORTOISE.

44. **Alcyonium** *testudinarium.* Elliptical patches, a little convex above, and concave below, friable, and reticulated; the upper surface garnished with a coat-

ing of tufts, osculated on their borders; colour greyish; height from twenty to twenty-five centimetres.

European seas.

ORBICULAR.

44. Alcyonium *orbiculatum.* A thick orbicular mass, compressed, very porous both within and without; of a firm consistency, and surface rough to the touch; height from eight to nine centimetres.

RADIATED.

45. Alcyonium *radiatum.* An orbicular and rather concave mass, sleek, plaited in rays toward the borders, having in the middle a projecting disk, composed of about six conoidical tubercles, that are united and cavernose; lower surface convex; border garnished with ribs of unequal length, of a fibrous texture, and radiating; colour yellowish white; height sixty-five millimetres.

POINTED.

46. Alcyonium *cuspidiferum.* Base in the form of a thick hollow pedestal, divided above into upright lobes, which are very long, crenated, fistular, and pointed; of a rather leathery consistence; height three decimetres.

GRANULOUS.

47. Alcyonium *granulosum.* Orbicular masses, convex above, flattened below, with some irregular gaps and furrows; height from three to five centimetres.

European Ocean.

FETID.

48. Alcyonium *putridosum.* Spindle-shaped, short, and very bulging, in the form of a pear or pomegranate; fibres very fine, closely compacted and intertwined on the inside, but stronger and parallel, or in bundles, at the projecting extremities.

Australasia, Vancouver's Island.

Nota. This Alcyonium is very fetid.

PURPLE.

49. Alcyonium *purpureum.* Large patches, from ten to twelve millimetres thick, firm, porous, and internally spongy; surface sleek; colour deep purple, like the lees of wine.

Cape Ewin, Australasia.

MORIL.

50. Alcyonium *boletus.* Resembling a moril in form and size; pedicle short and hard, gradually dilating into an oval mass, irregular, and obliquely truncated at the summit; unequally incrusted, tuberculous, internally porous, fibres loose, branchy, and dilating in thin layers; colour brown.

Australasia.

MORIL-FORMED.

51. Alcyonium *boletiforme.* A round mass; firm, flattened on one side, and rather convex on the other; having on its crest and on the convex side scattered and tuberculous cells; height about a decimetre.

PALYTHOA.

Polypidom in one extended patch, covered with cylindrical protuberances or papillæ of more than a centimetre in height, and united to each other; the cavities or cells insulated, almost longitudinally partitioned, and containing only one polypus.

The Palythoas vary but little in their forms, and exhibit a mass composed of papillous protuberances five or six millimetres wide, and from one to one and a half centimetre high; these papillæ are united and adhere together almost to their extremity, which is round, and pierced at the centre so as to allow the issue of the polypus. It is not improbable but that this opening may be the mouth of the animal; which is contained in a large cell, having its partitions marked with projecting and longitudinal laminæ, the number of which I have not been able to ascertain. The colour is an earthy grey. Such are the principal characters of the dried Palythoas. In the living state, that earthy colour does not exist, but brilliant hues then adorn this animated mass; for I do not look upon these papillæ as inert cells into which the polypi retire, but as forming part of the animal itself, as far more necessary, and far more connected with its existence, than are the shells of many testaceous Molluscas with theirs.

These Polypidoms, scarce in the collections, are found in the Antilles.

STELLATE.

1. **Palythoa** *stellata*. Cells polypiferous, with a star-formed opening.—Plate 15. fig. 2.

Coast of Jamaica.

OCELLATED.

2. **Palythoa** *osculata*. Papillæ wrinkled; openings of the cells radiated and star-formed.

Coast of St. Domingo.

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PLATES TO CLASS I.

ORDER I.

Cellepora ovoïdea.
Cellepora labiata.
Cellepora Mangnevillana.
Flustra pyriformis.
Flustra eriophora.
Flustra mamillaris.
Pherusa tubulosa.
Electra verticillata.
Elzarina Blainvillii.
Cellaria hirsuta.
Caberea dichotoma.
Canda arachnoïdes.
Crisia tricyttara.
Acamarchis Neritina.
Acamarchis dentata.
Menipea hyalæa.
Eucratea chelata.
Ætea anguina.

ORDER II.

Pasithea tulipifera.
Pasithea quadridentata.
Amathia cornuta.
Amathia spiralis.
Nemertesia Janini.
Aglaophenia arcuata.
Dynamena distans.
Dynamena divergens.
Sertularia elongata.
Sertularia arbuscula.
Idia pristis.
Clytia urnigera.
Laomedea Antipathes.
Thoa Savignii.
Salacia tetracyttara.
Naïsa reptans.
Naïsa lucifuga.
Cymodocea ramosa.
Cymodocea simplex.

ORDER III.

Tibiana fasciculata.
Tubularia annulata.
Tubularia cornucopiæ.

PLATES TO CLASS II.

ORDER I.

Telesto aurantiaca.
Liagora canescens.
Neomeris dumetosa.
Acetabularia crenulata.
Polyphysa aspergillosa.
Nesea dumetosa.
Galaxaura rigida.

ORDER II.

Jania pygmæa.
Jania pumila.
Jania pedunculata.
Jania verrucosa.
Jania micrarthrodia.
Jania rubens. Var. E. S. Var. a.
Jania rubens. Var. E. S. Var. b.
Corallina Cuvieri.
Corallina gracilis.
Corallina Turneri.
Corallina crispata.
Corallina simplex.
Corallina prolifera.
Amphiroa rigida.
Amph. fusoïdes.
Amph. Gaillonii.
Amph. verrucosa.
Amph. interrupta.
Amph. jubata.
Halimeda irregularis.
Halimeda tuna.

ORDER III.

Udotea flabellata.
Melobesia pustulata.
Melobesia farinosa.

PLATES TO CLASS III.

ORDER II.

Anadyomena flabellata.
Antipathes pinnatifida.
Antipathes Boscii.
Gorgonia pustulosa.
Plexaura olivacea.
Eunicea mammosa.

ORDER III.

Isis gracilis.
Mopsea verticillata.
Melitea textiformis.
Adeona grisea.

PLATES TO CLASS IV.

Alcyonium lobatum.
Do. do.
Alc. lobat. polyp.
Palythoa stellata.

EXPLANATION OF TERMS.

Anastomosed,	branching out, and reuniting, thus forming meshes, and giving a net-work appearance.
Articulated,	jointed.
Australasia,	islands that lie south of Asia, as New Holland, New Guinea, &c. &c.
Axillary,	coming from the junction of the stem and branch.
Bifid,	cleft in two.
Bifurcated,	two-forked.
Bractea,	floral leaf.
Campanulated,	bell-shaped.
Cartilaginous,	gristly.
Cil,	hair like an eye-lash.
Ciliated,	fringed.
Corymbus,	a broad-topped spike.
Cretaceous,	chalky.
Cuneiform,	wedge-shaped.
Deltoïdes,	triangular.
Desiccation,	dried state.
Dichotomous,	dividing in two equal branches.
Digitated,	like fingers.
Filiform,	like thread.
Florida,	applied to red marine plants.
Foliated,	leafy appearance.
Friable,	crumbly.

Frondescent,	cells and their bases the same material.
Geniculated,	knee-jointed.
Gibbous,	protuberant.
Imbricated,	tiled one over the other.
Lacinules,	jags or shreds.
Laciniated,	jagged.
Lynceous,	woody.
Molluscas,	soft-bodied animals, as worms, oysters, &c.
Oscules,	lips, here applied to the holes in sponges.
Ovaria,	the supposed embryos of future polypidoms.
Paniculated,	an assemblage growing on stalks, irregularly united to one stalk, like oats, or many grasses.
Pedicels, *Pedicules,*	little foot-stalks.
Pedunculus,	a foot-stalk.
Pelagian,	sea deeps.
Pinnated,	winged, or growing like the feather part of a quill.
Pinnates, and *Pinules,*	the pinnated expansions.
Proliferous,	shooting out fresh branches from the summits of former ones.
Pyriform,	like a pyramid.
Rhomb,	a figure of four sides.
Rhomboidal,	nearly of the figure of a rhomb.
Sessile,	close to the stem without a foot-stalk.
Setaceous,	bristly.
Simple,	unbranched.
Spatulated,	spoon-shaped.
Stipitated,	standing on a pillar.
Stipula,	a prop.
Stoloniferous,	having suckers.

Striated,	channelled.
Sub,	when shape or any other character cannot be precisely defined, *sub* is prefixed to the term; as sub-foliated, obscurely leaf-shaped.
Tetrachotomous,	in four equal branches.
Thalassiophytes,	signifying a daughter of the Ocean; but here applied to marine plants.
Trichotomous,	in three equal branches.
Truncated,	lopped off.
Urceolated,	pitcher-shaped.
Verticillated,	whirled.
Vesicula,	a little bladder.

EXPLANATION OF THE PLATES.

PLATE I.

Fig. 1. *Cellepora ovoïdea*, p. 38.
  a. The natural size, on the leaf of a marine plant.
  B. Cells magnified.
2. *Cellepora labiata*, p. 39.
  a. Groups of cells, of the natural size, on a fucus.
  B. Cell magnified, seen sidewise.
  C. . . in front.
  D. . . truncated.
3. *Cellepora Mangnevillana*, p. 39.
  a. Of the natural size, on the *Fucus hirsutus* of Linnæus.
  B. Cell magnified.
4. *Flustra pyriformis*, p. 45.
  a. Of the natural size.
  B. Fragment of a branch, magnified.
5. *Flustra eriophora*, p. 48.
  a. Groups of cells, of the natural size, on a fucus leaf.
  B. Cells magnified.
6. *Flustra mamillaris*, p. 49.
  a. Groups of cells, of the natural size, on a marine plant.
  B. Cells magnified.

PLATE II.

Fig. 1. *Pherusa tubulosa*, p. 53.
  a. The front of a branch, of the natural size.
  B. The back.
  C. Cells magnified.
2. *Electra verticillata*, p. 53.
  a. A branch, of the natural size.
  B. Cells magnified.
3. *Elzarina Blainvillii*, p. 54.
  a. The natural size.
  B. Extremity of a branch, magnified.
4. *Cellaria hirsuta*, p. 55.
  a. Of the natural size.
  B. Fragment of a branch, magnified.
5. *Caberea dichotoma*, p. 56.
  a. The natural size.
  B. The fore part of an articulation, magnified.
  C. The back.
6. *Canda arachnoïdes*, p. 57.
  a. The natural size.
  B. Fragment of a branch magnified, seen in front.
  C. Ditto the back.
  D. The transverse cut of a branch, magnified.

PLATE III.

Fig. 1. *Crisia tricyttara*, p. 61.
  a. A branch, of the natural size.
  B. The fore part of an articulation, magnified.
  C. The back.
2. *Acamarchis Neritina*, p. 58.
  a. A branch, of the natural size.
  B. A fragment of a magnified branch, shown in the back.
3. *Acamarchis dentata*, p. 59.
  a. A branch, of the natural size.
  B. Fragment of a magnified branch, seen in front.

Nota. In B, Fig. 1, as well as B, fig. 3, are shown many cells which have lost their upper membrane.

4. *Menipea Hyalæa*, p. 63.
  a. A branch, of the natural size.
  B. Cell magnified, seen in front.
  C. Ditto, seen in the back.
  D. Cells magnified, seen sidewise.
5 *Eucratea chelata*, p. 64.
  a. The fragment of a branch, magnified.
6. *Ætea anguina*, p. 65.
  a. Fragment of a branch magnified, with the cells in various positions.
7. *Pasithea tulipifera*, p. 67.
  a. Fragment of a branch, magnified.
8. *Pasithea quadridentata*, p. 67.
  a. Fragment of a branch, magnified.
  B. Ovarium transversely striated, and magnified.

PLATE IV.

Fig. 1. *Amathia cornuta,* p. 69.
  a. Of the natural size.
  B. Groups of cells, magnified.
2. *Amathia spiralis,* p. 69.
  a. Of the natural size.
  B. Fragment of a branch, magnified.
3. *Nemertesia Janini,* p. 71.
  a. The extremity of a stalk, of the natural size.
  B. Fragment of a sprig magnified, garnished with its double cells.
  C. Ovarium magnified.
4. *Aglaophenia arcuata,* p. 73.
  a. A branch, of the natural size.
  B. Fragment of a branch, magnified.

PLATE V.

Fig. 1. *Dynamena distans,* p. 80.
  a. Of the natural size.
  B. Branch with cells, magnified.
2. *Dynamena divergens,* p. 80.
  a. Of the natural size.
  B. Branch with cells, magnified.
3. *Sertularia elongata,* p. 82.
  a. The natural size.
  B. Branch with its cells, magnified.
  C. Ovarium.

Fig. 4. *Sertularia arbuscula*, p. 84.
  a. The natural size.
  B. Branch with its cells, magnified.
  C. Ovarium.
5. *Idia pristis*, p. 87.
  a. Of the natural size.
  B. The front of a branch, magnified.
  C. The back ditto.
  D. An insulated cell, greatly magnified.
  E. Transverse cut of a magnified branch.
6. *Clytia urnigera*, p. 89.
  a. Of the natural size.
  B. Cells magnified.
  C. Ovarium.

PLATE VI.

Fig. 1. *Laomedea Antipathes*, p. 90.
  a. Of the natural size.
  B. Fragment of a branch, magnified.
2. *Thoa Savignii*, p. 93.
  a. The natural size.
  B. Branches magnified.
  C. Ovaria.
3. *Salacia tetracyttara*, p. 93.
  a. The natural size.
  B. The lower part of a branch, magnified.
  C. Ovarium.
4. *Naïsa reptans*, p. 99.
  A. This figure was copied from Trembley.
5. *Naïsa lucifuga*, p. 99.
  A. Copied from Vaucher.

PLATE VII.

Fig. 1. *Cymodocea ramosa,* p. 95.
  a. Of the natural size.
  B. Fragment of a branch, magnified.
2. *Cymodocea simplex,* p. 95.
  a. Of the natural size.
  B. Fragment of a stem, magnified.
3. *Tibiana fasciculata,* p. 97.
  a. Of the natural size.
4. *Tubularia annulata,* p. 100.
  Of the natural size.
5. *Tubularia cornucopiæ,* p. 100.
  Of the natural size.
6. *Telesto aurantiaca,* p. 105.
  Of the natural size.
7. *Liagora albicans,* p.108.
  Lower part of the Polypidom, of the natural size.
8. *Neomeris dumetosa,* p. 109.
  a. Of the natural size.
  B. Polypidom, a little magnified.

PLATE VIII.

Fig. 1. *Acetabularia crenulata,* p. 110.
  Of the natural size.
2. *Polyphysa aspergillosa,* p. 111.
  a. Of the natural size.
  B. Polypidom magnified.
  C. Cell magnified, and entire.
  D. Cell cut transversely, magnified.

Fig. 3. *Nesea dumetosa*, p. 114.
  a. Polypidom entire, natural size.
  B. Branch, a little magnified.
4. *Galaxaura rigida*, p. 118.
  a. The natural size.
  B. Branch magnified.

PLATE IX.

Fig. 1. *Jania pygmæa*, p. 121.
  Of the natural size, on a *Galaxaura lapidescens*.
2. *Jania pumila*, p. 121.
  Of the natural size, with the leaf of the *Fucus turbinatus* of Linnæus.
3. *Jania pedunculata*, p. 121.
  a. Of the natural size.
  B. Extremity of a branch, magnified.
4. *Jania verrucosa*, p. 121.
  a. Of the natural size.
  B. Extremity of a branch, magnified.
5. *Jania micrarthrodia*, p. 122.
  a. Of the natural size.
  B. Branch magnified.
6. *Jania rubens, Var. E, Sub-var. A*, p. 122.
  Branch magnified.
7. *Jania rubens, Var. E, Sub-var. B*, p. 122.
  Branch magnified.
8. *Corallina Cuvieri*, p. 129.
  a. Of the natural size.
  B. Branch magnified.

PLATE X.

Fig. 1. *Corallina gracilis*, p. 130.
a. Of the natural size.
B. Branch magnified.
2. *Corallina Turneri*, p. 130.
a. The natural size.
B. Branch magnified.
3. *Corallina crispata*, p. 130.
Of the natural size.
4. *Corallina simplex*, p. 131.
Of the natural size.
5. *Corallina prolifera*, p. 132.
Of the natural size.

PLATE XI.

Fig. 1. *Amphiroa rigida*, p. 135.
Of the natural size.
2. *Amphiroa fusoïdes*, p. 135.
Of the natural size.
3. *Amphiroa Gaillonii*, p. 135.
Of the natural size.
4. *Amphiroa verrucosa*, p. 136.
Of the natural size.
5. *Amphiroa interrupta*, p. 137.
Fragment of a branch, magnified.
6. *Amphiroa jubata*, p. 137.
Of the natural size.
7. *Halimeda irregularis*, p. 139.
A branch, of the natural size.

8. *Halimeda tuna*, p. 139.
   a. Of the natural size.
   B. Of the natural size.

PLATE XII.

Fig. 1. *Udotea flabellata*, p. 141.
   Of the natural size.
2. *Melobesia pustulata*, p. 142.
   a. Polypidom of the natural size, on the *Chondrus polymorphus.*
   B. The same, magnified.
3. *Melobesia farinosa*, p. 142.
   Of the natural size, on a fucus leaf.
4. *Alcyonium lobatum*, p. 243.
   a. Of the natural size, and dried.
   B. The transverse cut of a branch, also dried.

PLATE XIII.

Fig. 1. *Alcyonium lobatum*, p. 243.
   a. The entire Polypus out of its cell, with its tentacula a little expanded, although enclosed within a membrane.
   B. Polypus wholly expanded, the upper part.
   C. One of its tentacula detached.
   D. Polypus expanded at the opening of its cell.
   E. Polypus contracted.
   F. Vertical section of an expanded Polypus.

G. A Polypus deprived of life, half contracted, and almost opaque.
H. The lower part of an expanded Polypus.
Nota. These figures are all magnified.

PLATE XIV.

Fig. 1. Polypus of the *Alcyonium lobatum,* p. 243.
A. Copied from D. Spix.
B. Ditto, copied from Ellis.
2. *Palythoa stellata,* p. 255.
Copied from Ellis.
3. *Anadyomena flabellata,* p. 189.
a. Of the natural size.
B. Fragment very much magnified.
4. *Antipathes pinnatifida,* p. 192.
a. Fragment of a stem, of the natural size.
B. Branch magnified.
5. *Antipathes Boscii,* p. 191.
Of the natural size.

PLATE XV.

Gorgonia pustulosa, p. 209.
Of the natural size.

PLATE XVI.

Plexaura olivacea, p. 217.
Of the natural size.

PLATE XVII.

Eunicea mammosa, p. 221.
Of the natural size.

PLATE XVIII.

Fig. 1. *Isis gracilis*, p. 236.
Of the natural size.
2. *Mopsea verticillata*, p. 233.
Stem and branch, of the natural size.

PLATE XIX.

Fig. 1. *Melitea textiformis*, p. 231.
Of the natural size.
2. *Adeona grisea*, p. 238.
Of the natural size.

THE END.

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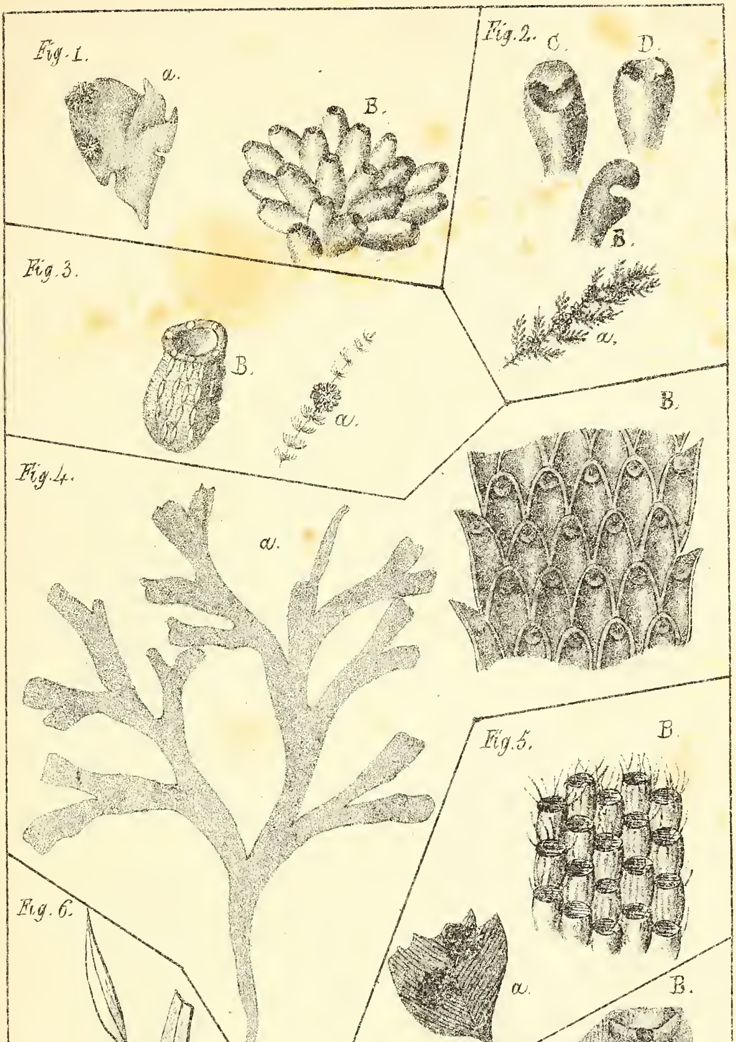
I.



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J. C. West. Junr. Bath. Lithog. Printed by J. West.

Fig. 1. Cellepora ovoïdea. —— Fig. 2. Cellepora labiata.

Fig. 3. Cellepora mangnevillana. —— Fig. 4. Flustra pyriformis.

Fig. 5. Flustra eriophora. —— Fig. 6. Flustra mamillaris.

II.

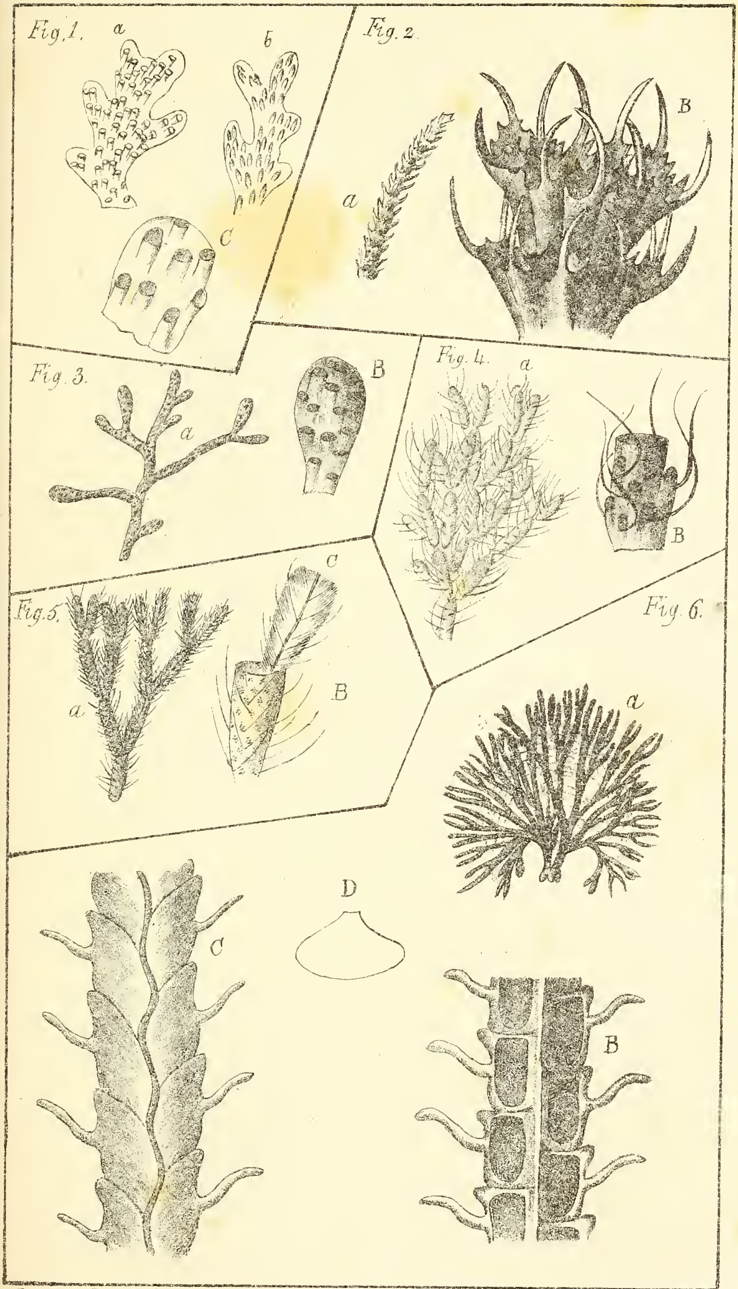
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Fig.1, Pherusa tubulosa. = Fig.2, Electra verticillata.
Fig.3, Elzerina blainvilii. = Fig.4. Cellaria hirsuta.
Fig.5, Caberea dichotoma. = Fig.6. Cauda arachnoïdes.

III.

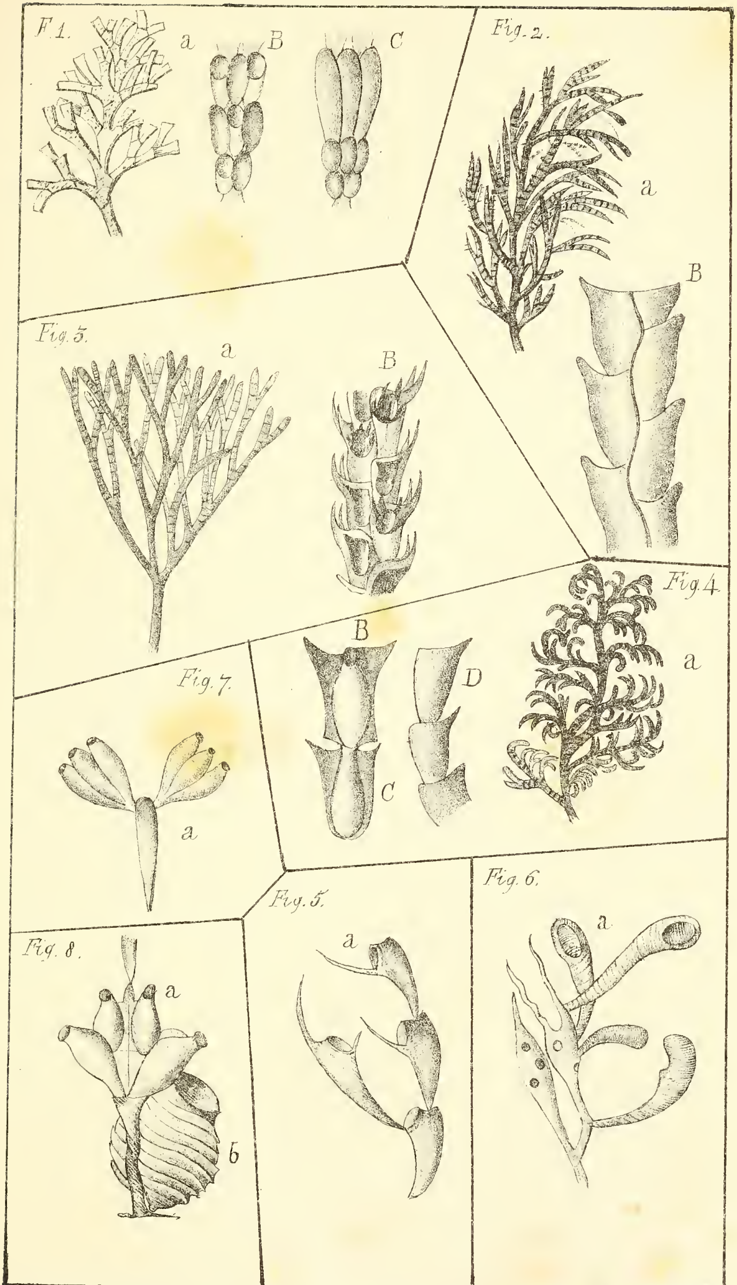
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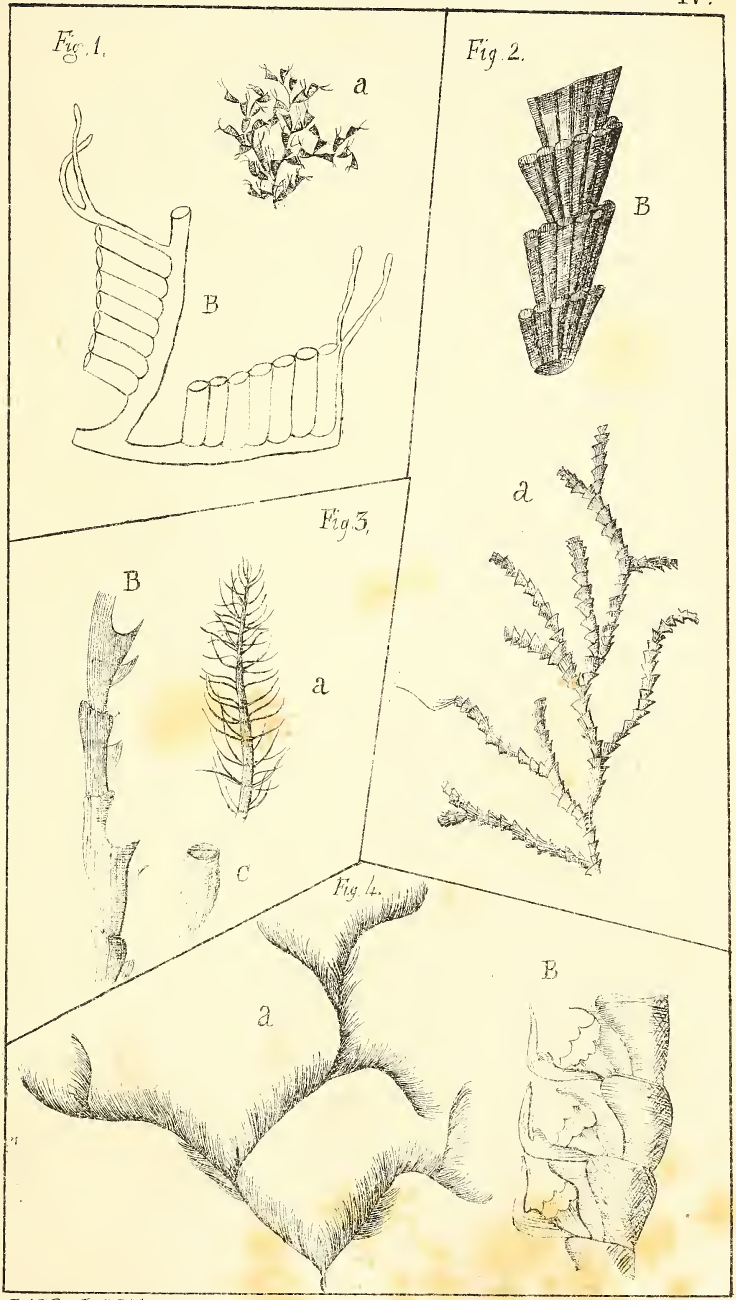
Fig. 1. Crisia tricythara. = Fig. 2. Acamarchis neritina.
Fig. 3. Acamarchis dentata. = Fig. 4. Menipea hyalæa.
Fig. 5. Eucratea chelata. = Fig. 6. Aetea anguina.
Fig. 7. Pasythea tulipifera. = Fig. 8. Pasythea quadridentata.

IV.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Fig, 1, Amathia cornuta, = Fig. 2 Amathia spiralis, =
Fig. 3, Nemertesia Janini, = Fig. 4 Aglaophenia arcuata,

V.

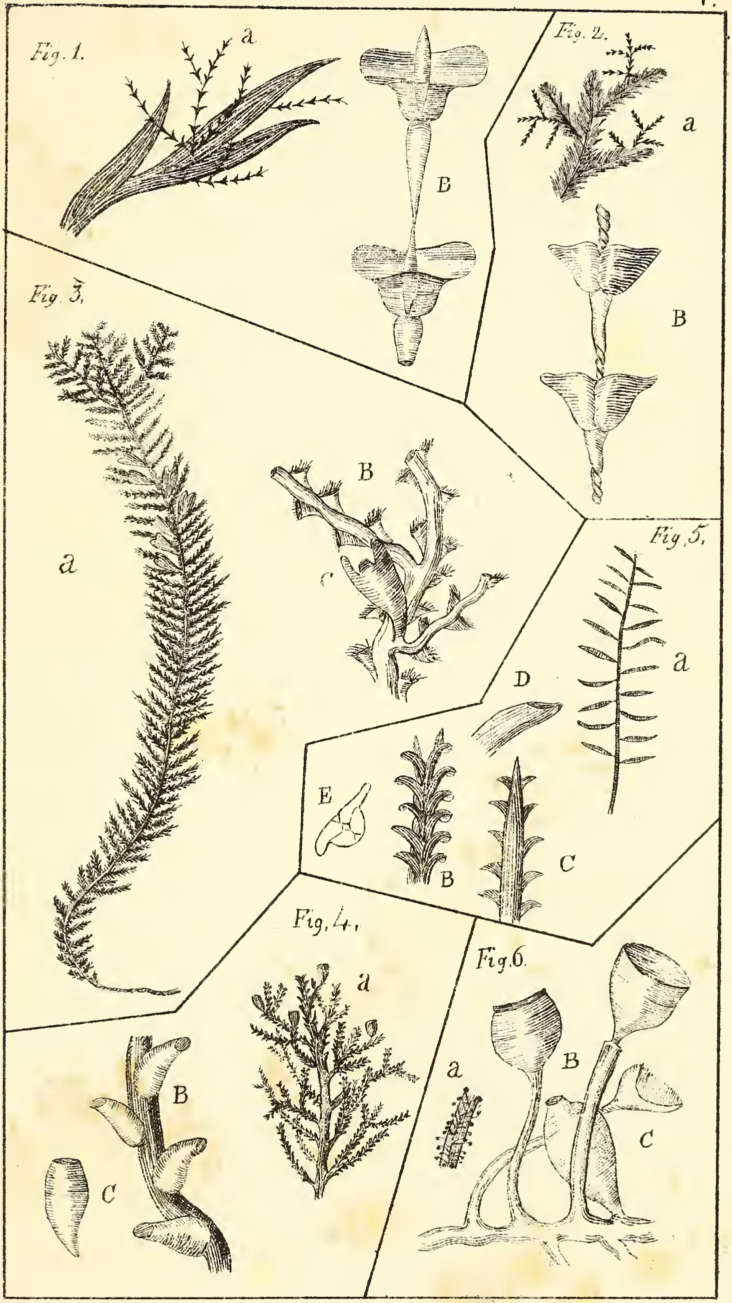
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Fig. 1, Dynamena distans, = *Fig. 2, Dyn. divergens,* =
Fig. 3, Sertularia elongata, = *Fig. 4, Sert. arbuscula,* =
Fig. 5, Idia pristis, = *Fig. 6, Clytia urnigera,* =

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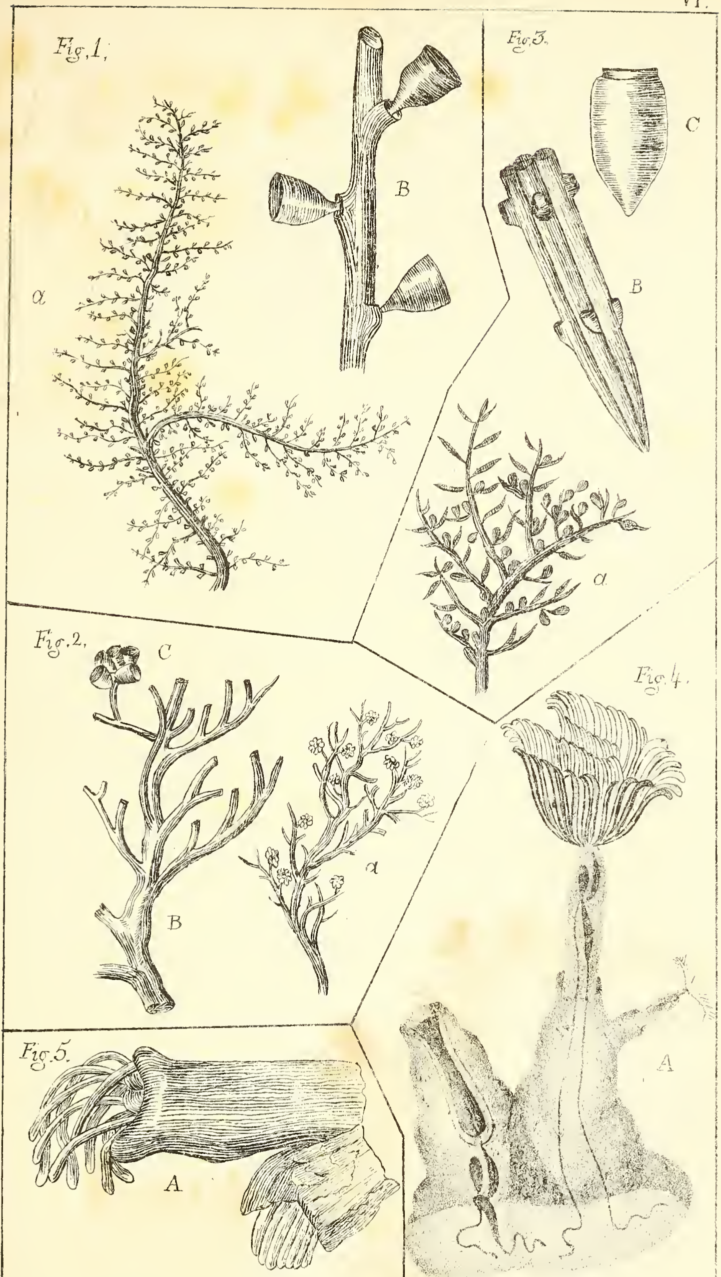
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Fig.1. Laomedea antipathes. = Fig.2. Thoa savignii. =
Fig.3. Salacia tetracythara. = Fig.4. Naïsa reptans. =
Fig.5. Naïsa lucifuga. =

VII.

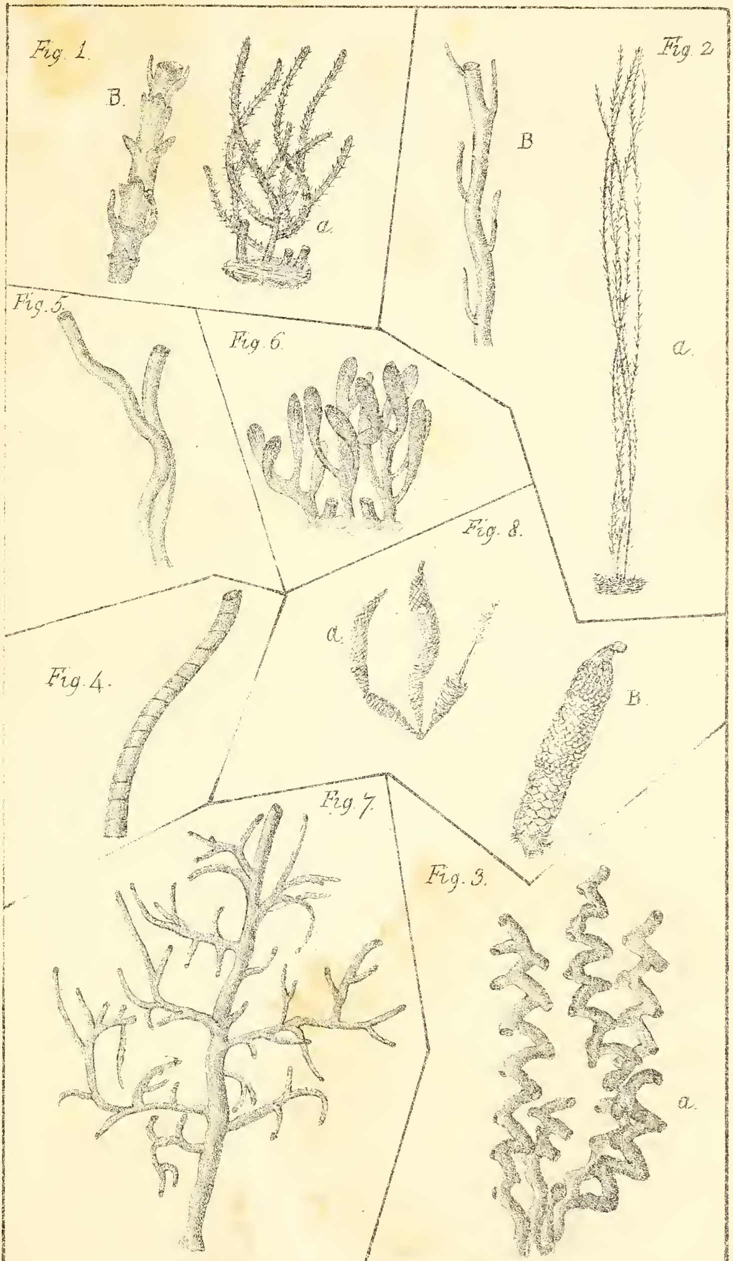
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Fig. 1, Cymodocea ramosa. = Fig. 2. Cym, simplex.
Fig. 3, Tibiana fasciculata. = Fig. 4. Tubularia annulata.
Fig. 5, Tub, cornucopiæ. = Fig. 6, Telesto aurantiaca.
Fig. 7, Liagora albicans. = Fig. 8, Neomeris dumetosa,

VIII.

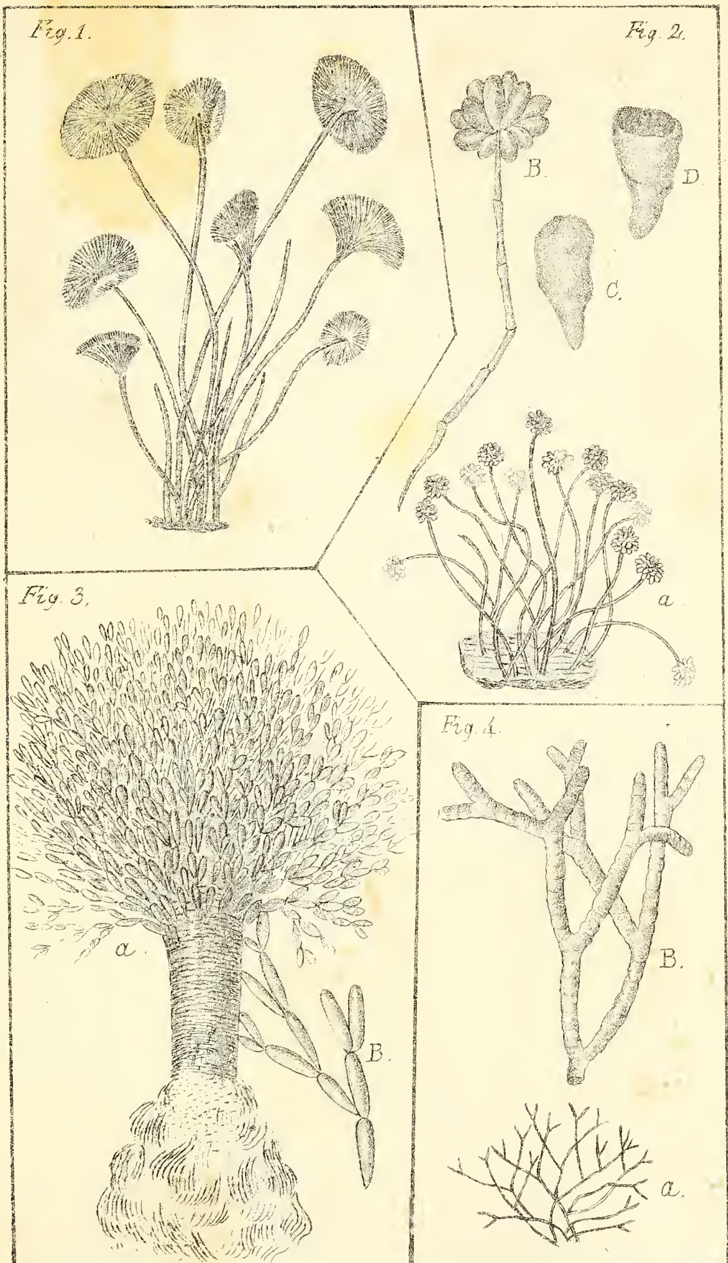
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Fig.1. Acetabularia crenulata=Fig.2, Polyphysa aspergillosa,
Fig.3, Nesea Dumetosa = Fig.4, Galaxaura rigida.

IX.

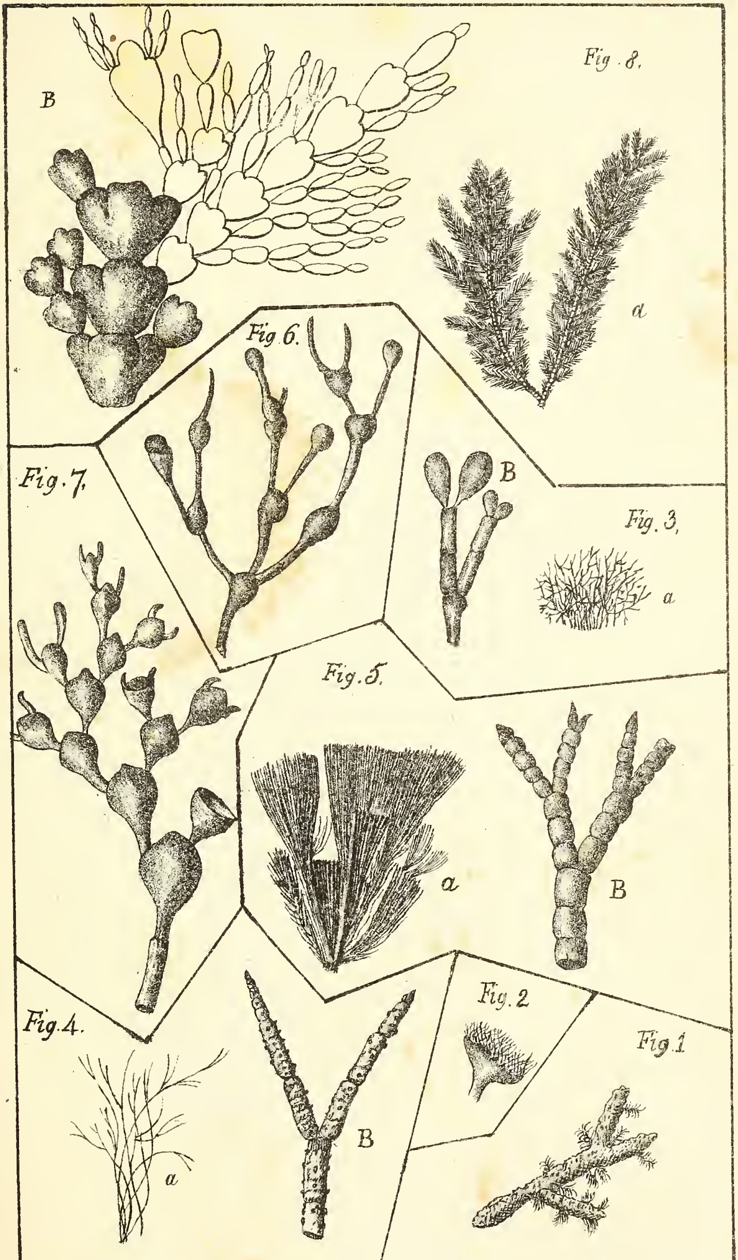
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Fig. 1. Jania pygmœa. — Fig. 2. J. pumila. — Fig. 3. J. pedunculata. —
Fig. 4. J. Verrucosa. — Fig. 5. J. micrarthrodia. — Fig. 6. J. Rubens. Var E. S. Var. a —
Fig. 7. J. Rubens. Var. E. S. Var. b. — Fig. 8. Corallina Cuvieri. —

X.

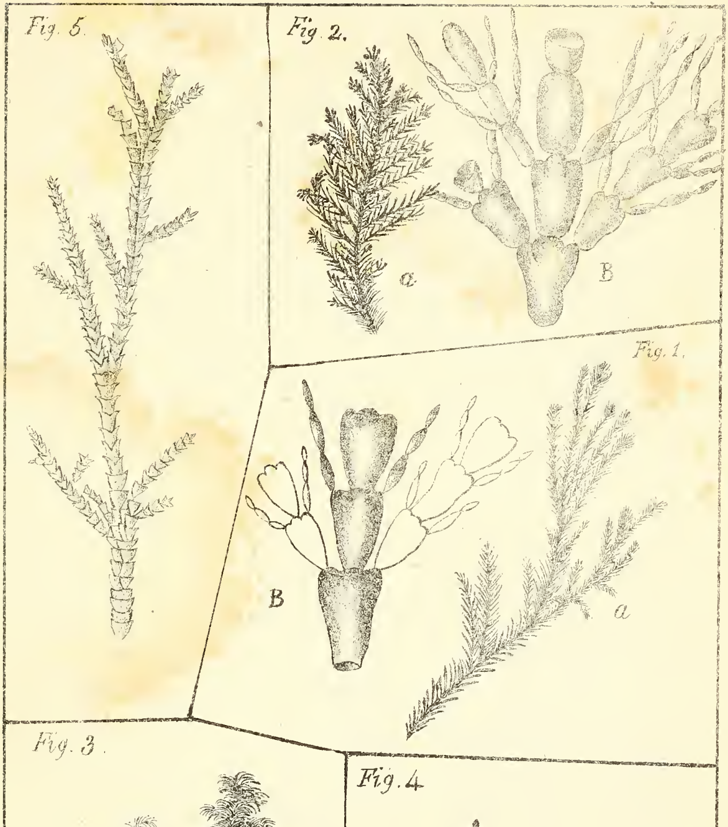
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Fig. 1. Corallina Gracilis. — Fig. 2. C. Turneri, —
Fig. 3. C. Crispata. — Fig. 4. C. Simplex, —
Fig. 5. C. Prolifera, —

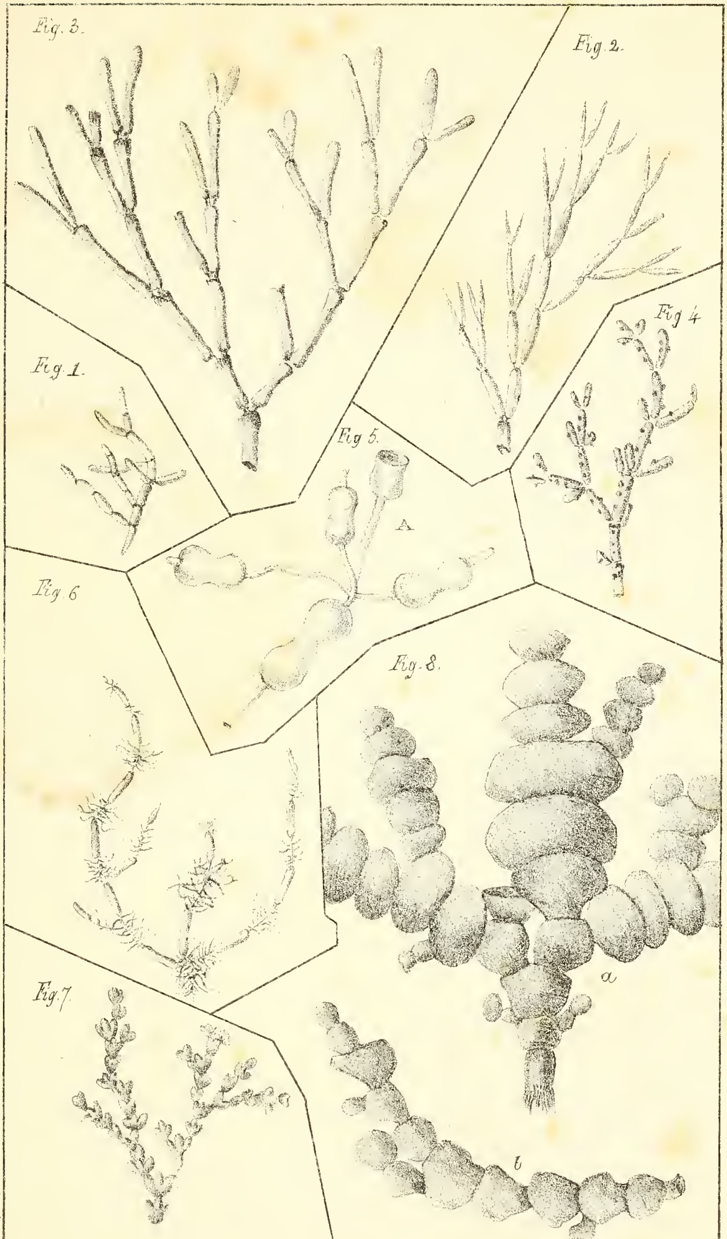
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Fig. 1. Amphiroa rigida.

Fig. 2. Am. fusoides.

Fig. 3. Am. gaillonii.

Fig. 4. Am. verrucosa.

Fig. 5. Am. interrupta.

Fig. 6. Am. jubata.

Fig. 7. Halimeda irregularis.

Fig. 8. Hal. tuna.

XII.

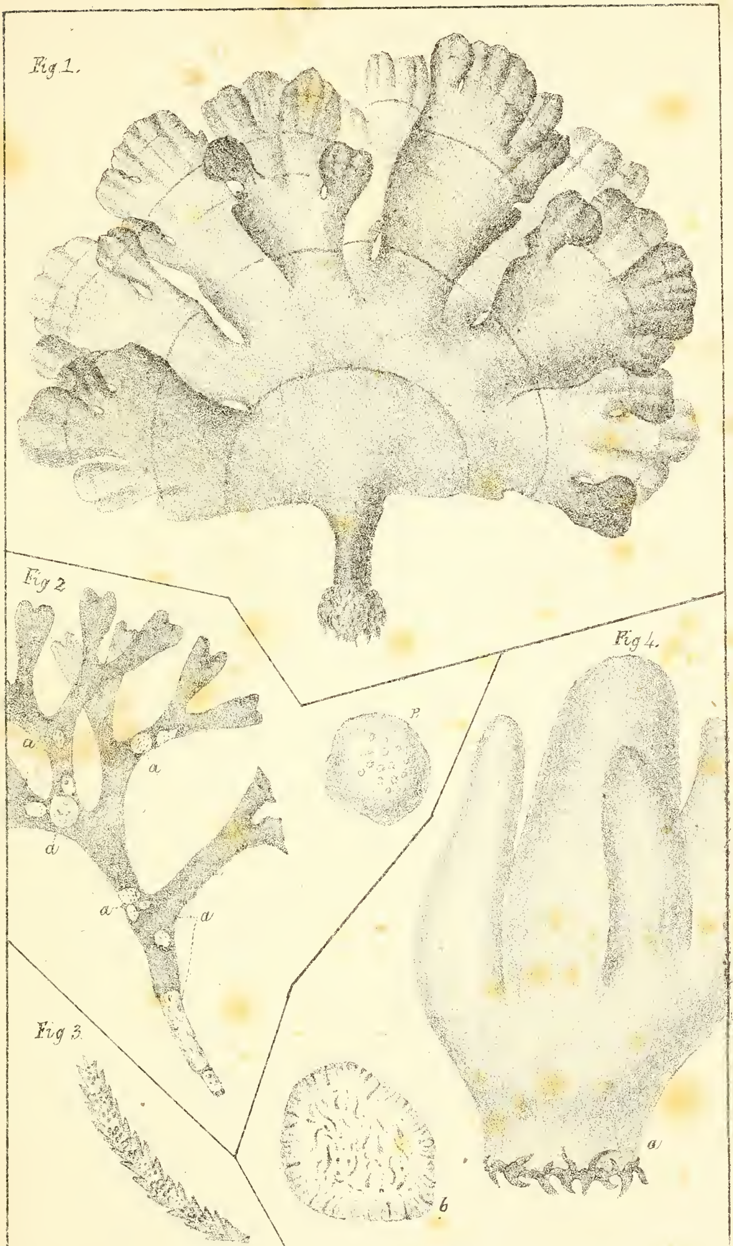
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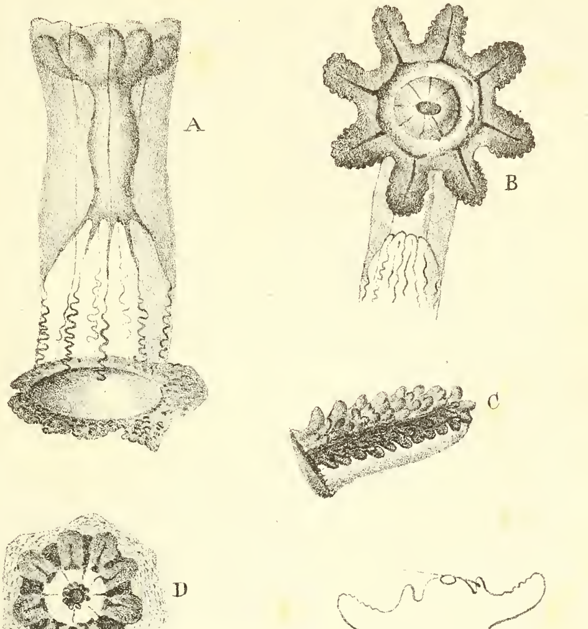
Fig. 1. *Udotea flabellata*

Fig. 2. *Melobesia pustulata*

Fig. 3. *Melobesia farinosa*

Fig. 4. *Alcyonium lobatum*



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Alcyonium lobatum.

XIV

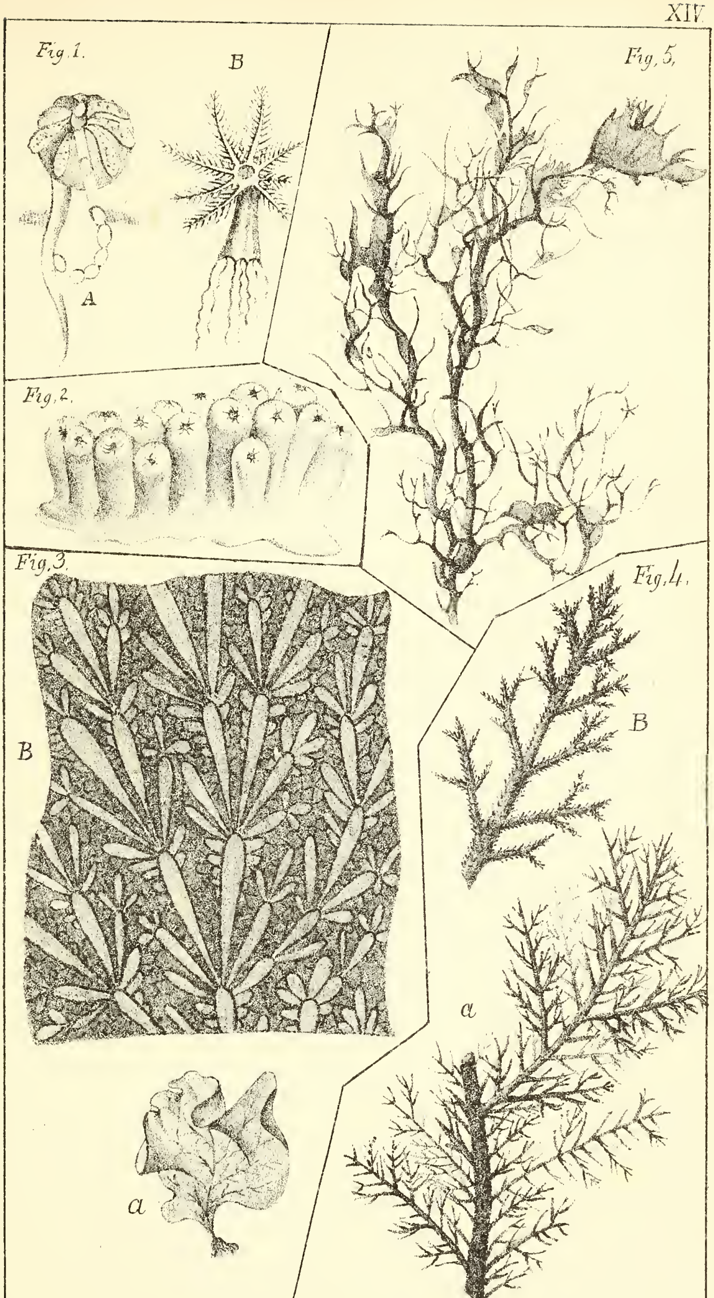
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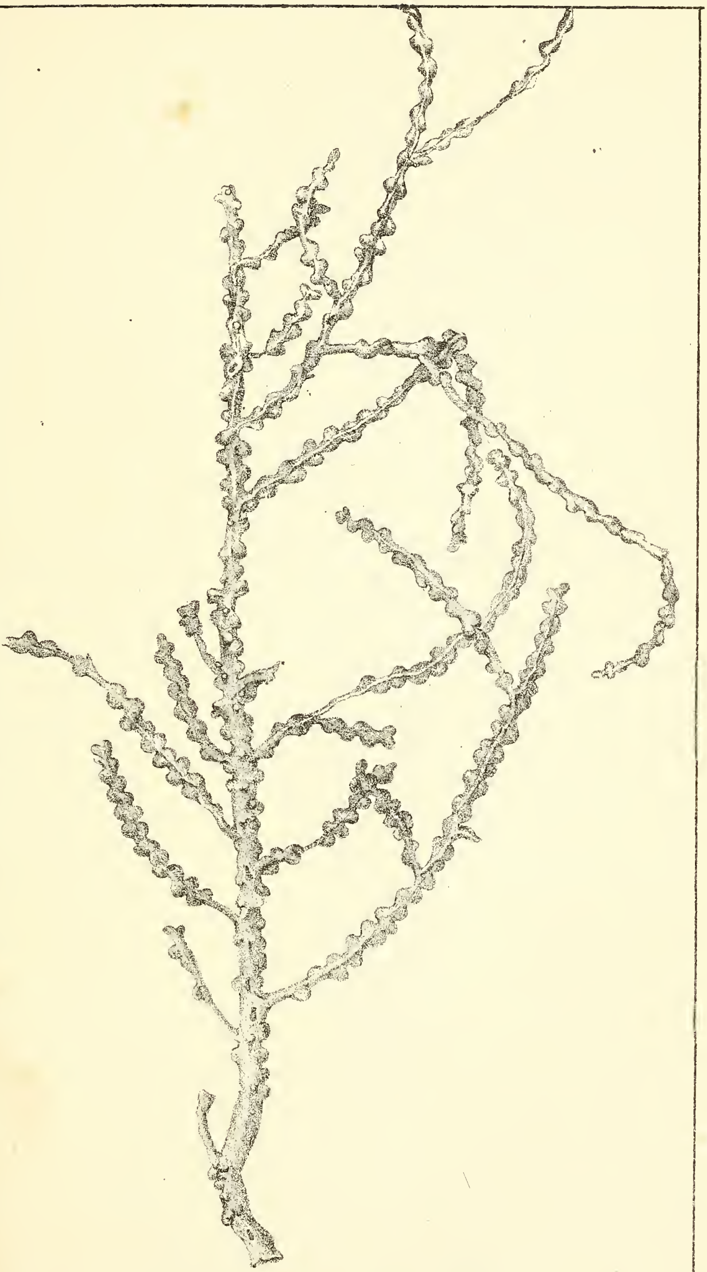
Fig.1. Alc. lobat polyp. = Fig.2. Palythoe stellata
Fig.3. Anadyomena flabellata. = Fig.4. Antipathes pinnatifida
Fig.5. Antipathes boscii.



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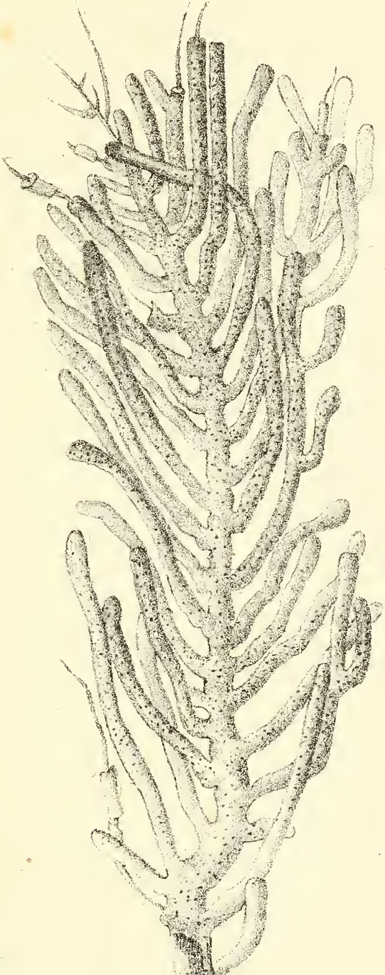
Gorgonia Pustulosa.



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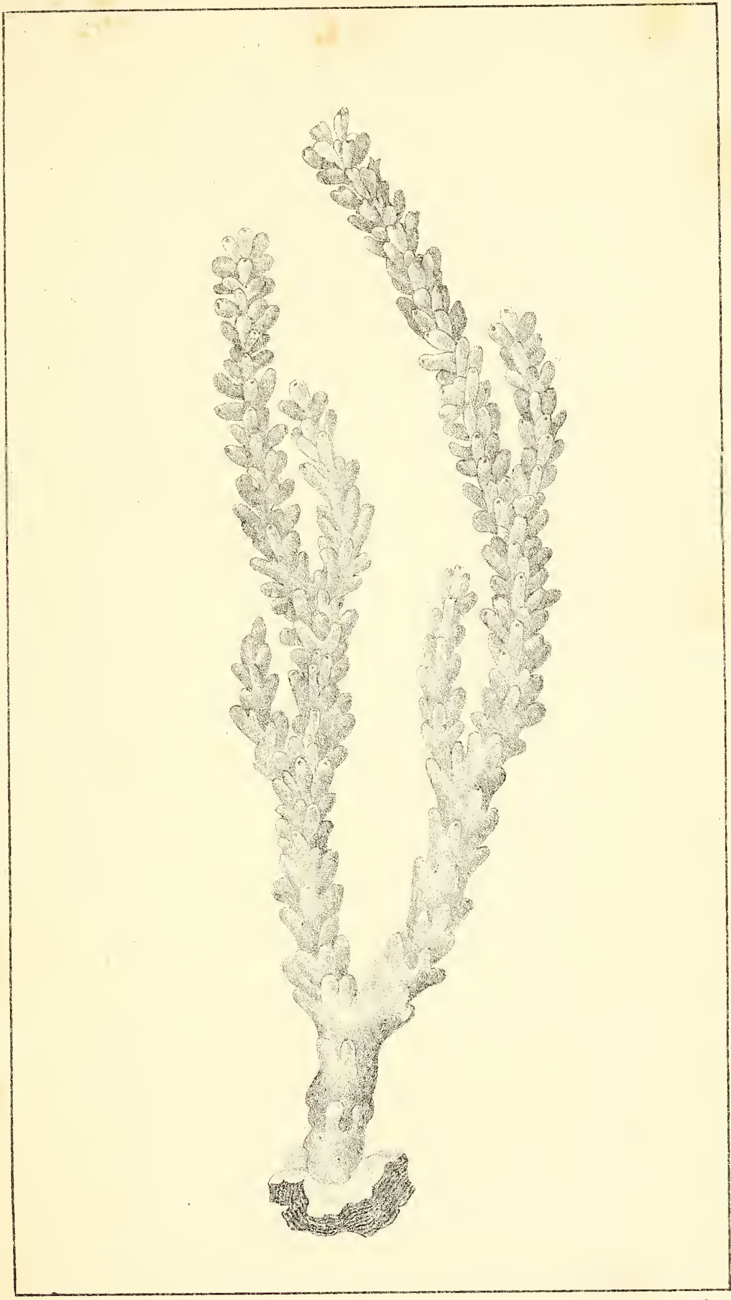
Plexaura Olivacea.



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Eunicea mammosa.

XVIII.

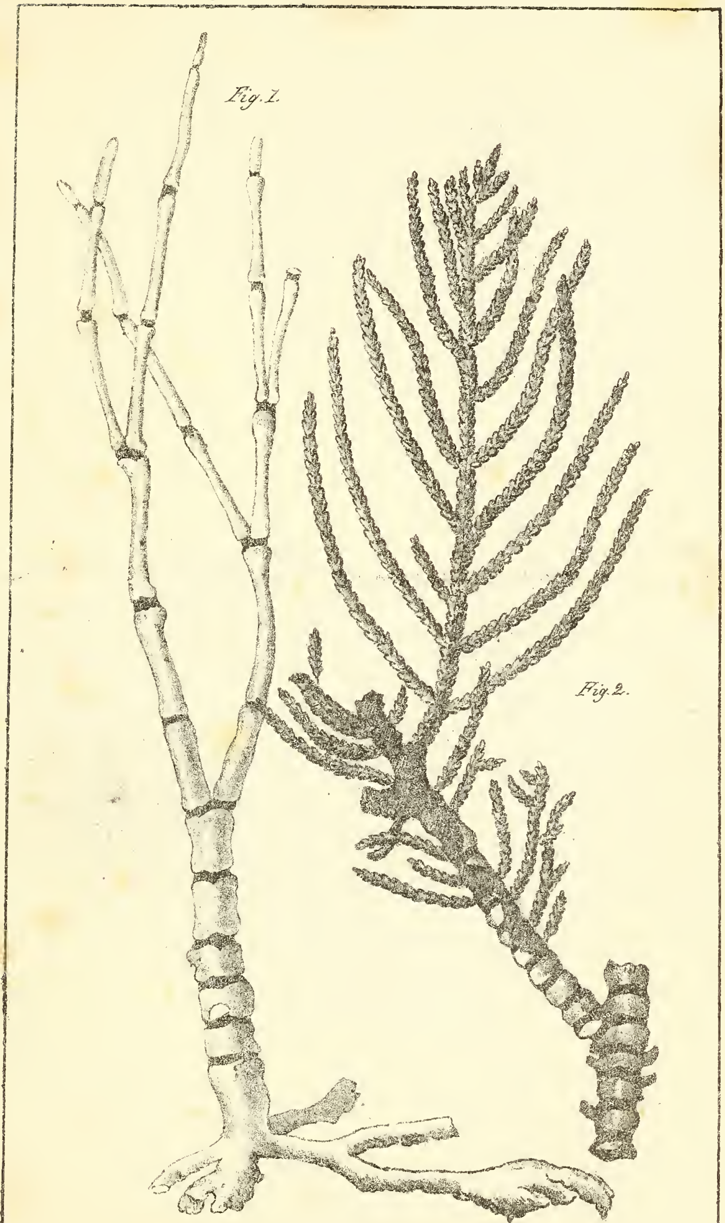

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Fig 1. Isis Gracilis   Fig. 2. Mopsea Verticillata.

XIX.

Fig. 1.

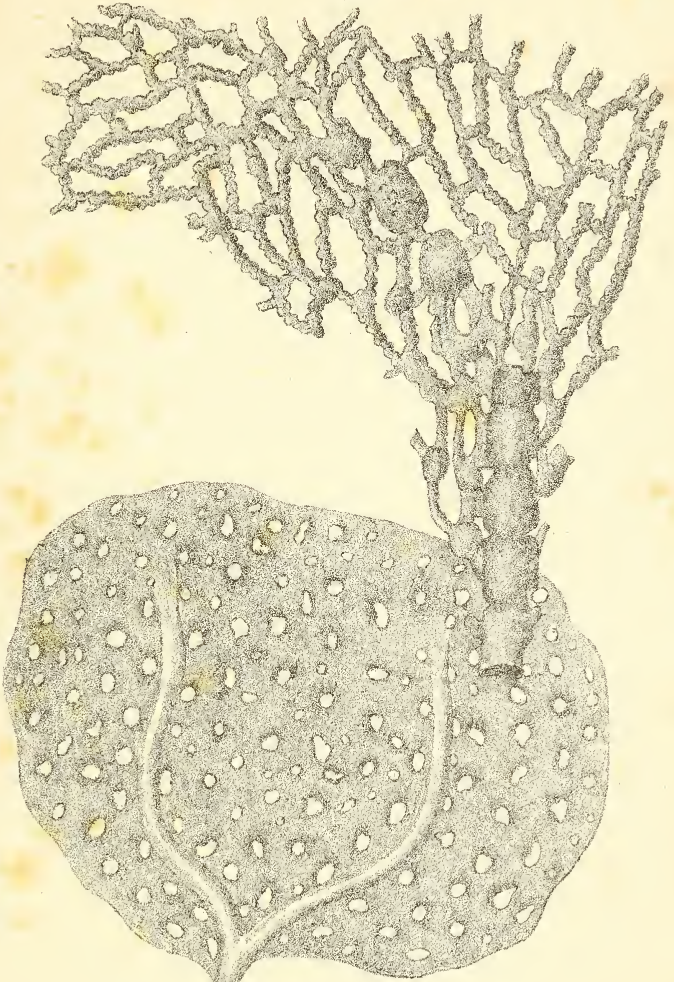

Fig. 2.

J.C.West Junr Lithog

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Fig 1. Melitea textiformis.

Fig. 2. Adeona Grisea.

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